SBIR

Small Business Innovation Research

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http://www.techpartnerships.noaa.gov

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DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

PROGRAM SOLICITATION FOR SMALL BUSINESS INNOVATION RESEARCH (SBIR)

1.0 PROGRAM DESCRIPTION

1.1 Introduction

The Department of Commerce (DOC) National Oceanic and Atmospheric Administration (NOAA) invites small businesses to submit research proposals under this solicitation. Firms with the capability to conduct research and development (R&D) in any of the topic areas listed in Section 8 of this solicitation and to commercialize the results of that R&D are encouraged to participate. The Small Business Innovation Research (SBIR) Program is not a substitute for existing unsolicited proposal mechanisms. **Unsolicited proposals are not accepted under the SBIR program.**

The SBIR program was originally established in 1982 by the Small Business Innovation Development Act (P.L. 97-219). It was then expanded by the Small Business Research and Development Enhancement Act of 1992, extending the program to the year 2000 and then to 2008. The program was reauthorized under Public Law 112-81, Section E and extended through September 30, 2017.

Eleven federal agencies set aside a portion of their extramural R&D budget each year to fund research proposals from small science and technology-based firms. The objectives of the SBIR program are to: stimulate technological innovation in the private sector; strengthen the role of small business in meeting Federal R&D needs; foster and encourage participation by socially and economically disadvantaged persons and women-owned small business concerns in technological innovation; and increase private sector commercialization of innovations derived from federal research and development. The NOAA SBIR Program identifies and solicits proposals in subtopics that fall within NOAA's mission.

NOAA is not obligated to make any awards under this solicitation and all awards are subject to the availability of funds.

NOAA is not responsible for any costs expended by the proposer in the development of the proposal and prior to award of any contract.

1.2 Three-Phase Program

Legislation requires the Department of Commerce to establish a three-phase SBIR program by reserving a percentage of its extramural R&D budget to be awarded to small business concerns for innovation research. SBIR policy is provided by the Small Business Administration through the SBA Policy Directives.

The funding vehicles for NOAA's SBIR program in both Phase I and Phase II are contracts. While the Phase II proposal process is covered in this announcement, this solicitation is for **Phase I proposals only**. A separate solicitation will not be issued requesting Phase II proposal submissions. Unsolicited proposals will not be accepted through the SBIR Program. A Phase II proposal can be submitted **only** by a Phase I awardee. NOAA has the unilateral right to select SBIR research topics and awardees in both Phase I and Phase II and award several or no contracts under a given subtopic.

1.2.1 Phase I – Feasibility Research

The purpose of Phase I is to determine the scientific, technical, and commercial merit and feasibility of the proposed research and the quality of performance of the small business concern receiving an award. Therefore, the proposal should concentrate on research that will significantly contribute to proving the feasibility of the proposed research, a prerequisite to further support in Phase II. NOAA Phase I awards are up to $95,000 and up to a six (6) month period of performance. Proposers are encouraged to consider, and discuss in their proposal, whether the research or research and development being proposed to NOAA also has private sector potential, either for the proposed application or as a base for other applications. Only DOC NOAA SBIR Phase I awardees will be eligible to submit a Phase II proposal.

1.2.2 Phase II – Research and Development

All firms that are awarded Phase I contracts under this solicitation will be given the opportunity to submit a Phase II proposal immediately following completion of Phase I. Phase II is the R&D or prototype development phase. It will require a comprehensive proposal outlining the research in detail, plan to commercialize the final product, and may require a company presentation to the panel. Instructions for Phase II proposal preparation and submission requirements will be provided to Phase I awardees toward the end of the Phase I period of performance. NOAA may also require delivery of the prototype. Phase II applicants will be required to provide information for the Small Business Administration (SBA) Database System (http://sbir.gov) when advised this system can accept their input.

Further information regarding Phase II proposals and SBA Database requirements will be provided to all firms receiving Phase I contracts. The following provides information for submitting a Phase II proposal to the Department of Commerce (DOC) National Oceanic and Atmospheric Administration (NOAA) SBIR program.

Phase II awards shall be for no more than **$400,000.** The period of performance for Phase II will depend upon the scope of the research, but should not exceed **24 months**. For planning purposes, historically NOAA Phase II awards are usually made in the month of June.

Each Phase II proposal will be evaluated against the criteria set forth in Solicitation NOAA 2015-1 (see Section 4.4). Phase II award decisions will be made based upon scientific and

technical quality, commercial potential, and available funds. Final recommended award decisions will be made by the NOAA Technology Partnerships Committee (TPC) to the Contracting Officer (CO) based upon rankings assigned by reviewers and consideration of other factors which includes possible duplication of ongoing research, and the importance of the proposed research as it relates to NOAA needs.

Phase II proposals should be more comprehensive than Phase I proposals and are **NOT** limited to 25 pages. One year after completing Phase II R&D activity the awardee shall be required to report on their commercialization activities.

1.2.3 Phase III – Commercialization

Under Phase III, the proposer is required to obtain funding from either the private sector, a non-SBIR Government source, or both, to develop the prototype into a viable product or non-R&D service for sale in the Federal government or private sector markets. SBIR Phase III refers to work that derives from, extends, or completes an effort made under prior SBIR funding agreements, but is funded by sources other than the SBIR Program. Phase III work is typically oriented towards commercialization of SBIR research or technology and may be for products, production, services, Research / Research and Development (R/R&D) or a combination thereof.

1.3 Manufacturing-related Priority

Executive Order (EO) 13329 “Encouraging Innovation in Manufacturing” requires SBIR agencies, to the extent permitted by law and in a manner consistent with the mission of that department or agency, to give high priority within the SBIR programs to manufacturing-related R&D. “Manufacturing-related” is defined as “relating to manufacturing processes, equipment and systems; or manufacturing workforce skills and protection.”

The NOAA SBIR Program solicits manufacturing-related projects through many of the subtopics described in this Solicitation. Further, NOAA encourages innovation in manufacturing by giving high priority, where feasible, to projects that can help the manufacturing sector through technological innovation in a manner consistent with NOAA’s mission. This prioritization will not interfere with the core project selection criteria described in Section 4.3.

1.4 Energy Efficiency and Renewable Energy Priority

The Energy Independence and Security Act of 2007 (P.L. 110-140) directs SBIR Programs to give high priority to small business concerns that participate in or conduct energy efficiency or renewable energy system R&D projects.

The NOAA SBIR Program solicits energy efficiency or renewable energy system R&D projects through many of the subtopics described in this Solicitation. Further, NOAA encourages innovation in energy efficiency or renewable energy system R&D by giving high priority, where feasible, to projects that conduct energy efficiency or renewable energy system R&D through technological innovation in a manner consistent with NOAA's mission. This prioritization will not interfere with the core project selection criteria: scientific and technical merit and the potential for commercial success.

1.5 Eligibility and Limitations

Proposers for both Phase I and Phase II **must** qualify as a small business concern for research or research and development (R/R&D) purposes (Section 1.7.11) at the time of the award and at any other time set forth in the SBA's regulations at 13 CFR 121.701-121.705. Each awardee must submit a certification (See Section 2.4.1 and 9.5) stating that it meets the size, ownership and other requirements of the SBIR Program at the time of award, and at any other time set forth in SBA's regulations at 13 CFR 121.701-705.

For Phase I, a minimum of two-thirds of the research and/or analytical effort must be performed by the awardee. For Phase II, a minimum of one-half of the research and/or analytical effort must be performed by the awardee.

For both Phase I and Phase II, the primary employment of the principal investigator (PI) must be with the small business concern (SBC) at the time of the award and during the conduct of the proposed project. Primary employment means that more than one-half of the principal investigator's time is spent in the employ of the SBC. **Primary employment with a SBC precludes full-time employment with another organization.**

For both Phase I and Phase II, all work must be performed by the SBC and its subcontractors in the United States. "United States" means the fifty states, the territories and possessions of the United States, the Commonwealth of Puerto Rico, the District of Columbia, the Republic of the Marshall Islands, the Federated States of Micronesia, and the Republic of Palau. However, based on a **rare and unique circumstance**, for example, a supply or material or other item or project requirement that is not available in the United States, NOAA may allow that particular portion of the R/R&D work to be performed or obtained in a country outside of the United States.

If a waiver is requested, it must be submitted, in writing, to the NOAA CO and SBIR Program Manager where work or supplies outside the United States are being considered and a detailed rational explaining steps taken to locate potential United States sources; if any United States sources were located and any potential concerns for use of those sources; and any potential cost differences between United States sources and foreign sources (if applicable). This waiver request shall be submitted via email to the points of contact in paragraph 1.6 at least fourteen calendar days prior to the solicitation closing date. It is in the firm's best interest to submit these waiver

requests as soon as they are known. Waivers are only approved in rare and unique circumstances.

In accordance with the SBIR/STTR Reauthorization Act of 2011, each SBIR agency must determine whether an applicant for a Phase I award that has won multiple prior SBIR awards meets the benchmark requirements for progress towards commercialization before making a new Phase I award to the applicant. Small business concerns are assessed on June 1 of each year using their prior Phase I and Phase II SBIR and STTR awards across all SBIR agencies.

The Phase II Transition Rate Benchmark sets the minimum required number of Phase II awards the applicant must have received for a given number of Phase I awards received during the specified period. NOAA's minimum Phase I to Phase II transition rate to be eligible to receive a new Phase I award is 0.25 over the past 5 fiscal years, excluding the most recently completed fiscal year. This transition rate benchmark applies only to Phase I applicants that have received more than 20 Phase I awards over the past 5 fiscal years, excluding the most recently completed fiscal year. This requirement does not apply to companies that have received 20 or fewer Phase I awards over the 5 year period. For those companies that have received more than 20 Phase I awards over the past 5 years, SBA posts the company transition rates on the Company Registry at SBIR.gov. Information on the Phase I to Phase II Transition Rate requirement is available at http://www.SBIR.gov/faq/performance.

Applicants to this solicitation that may have received more than 20 Phase I awards across all federal SBIR/STTR agencies over the past five (5) years should, prior to proposal preparation, verify that their company's Transition Rate on the Company Registry at SBIR.gov meets or exceeds the minimum benchmark rate of 0.25. The transition rate is calculated as the total number of SBIR and STTR Phase II awards a company received during the past 5 fiscal years divided by the total number of SBIR and STTR Phase I awards it received during the past 5 fiscal years excluding the most recently completed year.

SBA calculates individual company transition rates using SBIR and STTR award information across all federal agencies. SBA will identify, on June 1 of each year, the companies that fail to meet the benchmark. These companies will not be eligible to receive a Phase I award for a period of one year from that date. SBA will notify the companies and the relevant officials at the participating agencies.

If a company believes that the information used was incomplete or inaccurate, it may provide feedback through the Company Registry at www.sbir.gov. SBA accepts requests for reconsideration of the eligibility determination from April 1st through April 30th of each year. Additional information on the Transition benchmark is available at SBIR.gov.

Venture Capital Participation: NOAA elects to not use the authority that would allow venture capital operating companies (VCOCs), hedge funds or private equity firms to participate in the SBIR Program.

Unsolicited proposals or proposals not responding to subtopics listed herein are not eligible for SBIR awards. Only proposals that are directly responsive to the subtopics as described in Section 8 will be considered.

Potential awardees may not participate in the selection of any topic or subtopic nor in the review of proposals. All offerors, including Guest Researchers, contractors, Cooperative Research and Development Agreement (CRADA) partners and others working with NOAA may only submit a proposal if they:

- Had no role in developing or reviewing the subtopic
- Have not been the recipient of any information on the subtopic not available in the solicitation or other public means
- Have not received any assistance from DOC in preparing the proposal (including any 'informal' reviews) prior to submission.

NOAA may not enter into, or continue an existing CRADA with an awardee on the subtopic of the award.

1.6 Contact with NOAA

In the interest of competitive fairness, oral or written communication with NOAA or any of its components, other than the contacts provided immediately below, concerning additional information on the technical topics described in Section 8 of this solicitation **is strictly prohibited**.

For general information on the NOAA SBIR program contact:

Kelly Wright, Director of TPO
1305 East West Highway, Room 7604
Silver Spring, MD 20910

Telephone: (301) 713-3565 x184
Email: Kelly.Wright@noaa.gov

For information on the solicitation and other contractual issues contact:

Joan Clarkston, Contracting Officer
DOC/NOAA-EAD-KC
601 East 12th Street, Room 1734
Kansas City, MO 64106

Telephone: (816) 426-7469
E-mail: Joan.E.Clarkston@noaa.gov

Additional scientific and technical information sources are listed in Section 7.

1.7 Definitions

1.7.1 – Commercialization

The process of developing products, processes, technologies, or services and the production and delivering (whether by the originating party or others) of the products, processes, technologies, or services for sale to or use by the Federal government or commercial markets.

As used here, commercialization includes both Government and private sector markets.

1.7.2 – Essentially Equivalent Work

Work that is substantially the same research, which is proposed for funding in more than one contract proposal or grant application submitted to the same Federal agency or submitted to two or more different Federal agencies for review and funding consideration; or work where a specific research objective and the research design for accomplishing an objective are the same or closely related to another proposal or award, regardless of the funding source.

1.7.3 – Feasibility

The practical extent to which a project can be performed successfully.

1.7.4 - Funding Agreement

Any contract, grant, or cooperative agreement entered into between any Federal agency and any small business concern (SBC) for the performance of experimental, developmental, or research work, including products or services, funded in whole or in part by the Federal Government.

For purposes of this Solicitation, NOAA intends to award contracts in accordance with the Federal Acquisition Regulation.

1.7.5 – Historically Underutilized Business Zone (HUBZone) Small Business Concern

(See 13 CFR Part 126 for additional details)

Status as a qualified HUBZone Small Business Concern is determined by the Small Business Administration.

1.7.6 – Innovation

Something new or improved, having marketable potential, including: (1) development of new technologies; (2) refinement of existing technologies; or (3) development of new applications for existing technologies.

1.7.7 – Joint Venture

See 13 CFR 121.103(h).

***NOAA HAS CHOOSEN NOT TO PERMIT MAJORITY-OWNED BY MULTIPLE VENTURE CAPITAL OPERATING COMPANIES, HEDGE FUND, OR PRIVATE EQUITY FIRMS*.**

1.7.8 – Principal Investigator (PI)/Project Manager (PM)

The one individual designated by the applicant to provide the scientific and technical direction to a project supported by a funding agreement.

1.7.9 – Primary Employment

The primary employment of the principal investigator/project manager must be with the SBC at the time of award and during the conduct of the proposed project. Primary employment means that more than one half of the PI/PM's time is spent in the employ of the small business concern. This precludes full-time employment with another organization.

1.7.10 – Prototype

A model of something to be further developed, which includes designs, protocols, questionnaires, software, and devices.

1.7.11 – Research or Research and Development (R/R&D)

Any activity that is (a) a systematic, intensive study directed toward greater knowledge or understanding of the subject studied; (b) a systematic study directed specifically toward applying new knowledge to meet a recognized need; or (c) a systematic application of knowledge toward the production of useful materials, devices, systems, or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

In general, the NOAA SBIR program will fund Phase I and Phase II proposals with objectives that can be defined by (b) and (c) in the above paragraph.

1.7.12 – SBIR Technical Data

All data generated during the performance of a SBIR award.

1.7.13 – SBIR Technical Data Rights

The rights an SBIR awardee obtains in data generated during the performance of any SBIR Phase I, Phase II, or Phase III award that an awardee delivers to the Government during or upon completion of a Federally-funded project, and to which the Government receives a license.

1.7.14 – Small Business Concern (SBC)

A concern that meets the requirements set forth in 13 CFR 121.702.

1.7.15 – Socially and Economically Disadvantaged Small Business Concern

See 13 CFR 124, Subpart B.

1.7.16 – Subcontract

Any agreement, other than one involving an employer-employee relationship, entered into by an awardee of a funding agreement calling for supplies or services for the performance of the original funding agreement.

1.7.17 – Women-Owned Small Business

An SBC that is at least 51% owned by one or more women, or in the case of any publically owned business, at least 51% of the stock is owned by women, and women control the management and daily business operations.

1.8 Fraud, Waste and Abuse

Fraud includes any false representation about a material fact or any intentional deception designed to deprive the United States unlawfully of something of value or to secure from the United States a benefit, privilege, allowance, or consideration to which an individual or business is not entitled. Waste includes extravagant, careless, or needless expenditure of Government funds, or the consumption of Government property, that results from deficient

practices, systems, controls, or decisions. Abuse includes any intentional or improper use of Government resources, such as misuse of rank, position, or authority or resources. Examples of fraud, waste, and abuse relating to the SBIR Program include, but are not limited to:

(i) misrepresentations or material, factual omissions to obtain, or otherwise receive funding under, an SBIR award;

(ii) misrepresentations of the use of funds expended, work done, results achieved, or compliance with program requirements under an SBIR award;

(iii) misuse or conversion of SBIR award funds, including any use of award funds while not in full compliance with SBIR Program requirements, or failure to pay taxes due on misused or converted SBIR award funds;

(iv) fabrication, falsification, or plagiarism in applying for, carrying out, or reporting results from an SBIR award;

(v) failure to comply with applicable federal costs principles governing an award;

(vi) extravagant, careless, or needless spending;

(vii) self-dealing, such as making a sub-award to an entity in which the PI has a financial interest;

(viii) acceptance by agency personnel of bribes or gifts in exchange for grant or contract awards or other conflicts of interest that prevents the Government from getting the best value; and

(ix) lack of monitoring, or follow-up if questions arise, by agency personnel to ensure that awardee meets all required eligibility requirements, provides all required certifications, performs in accordance with the terms and conditions of the award, and performs all work proposed in the application.

Report any allegations of fraud, waste and abuse to:

Department of Commerce
Office of Inspector General
Complaint Intake Unit, Mail Stop 7886
1401 Constitution Avenue, N.W.
Washington, DC 20230

Telephone:

Local	202-482-2495
Toll free	1-800-424-5197
TTD	1-855-860-6950

Email: hotline@oig.doc.gov

Fax: 855-569-9235

Website: http://www.oig.doc.gov/Pages/online-hotline-complaint-form.aspx

2.0 CERTIFICATIONS

2.1 Certification of Size, Ownership, and SBIR Program Requirements

Awardees will be required to certify size, ownership and other SBIR Program requirements with the submission of SBIR proposal, at the time of award, and during the funding agreement life cycle. A copy of these certifications is provided in Section 2.4.1, 2.4.2, 9.5 and 9.6.

2.2 Research Projects with Human Subjects, Human Tissue, Data or Recordings Involving Human Subjects

2.2.1 Protection of Human Subjects

Any proposal that includes contractor participation in research involving human subjects, human tissue/cells, data or recordings involving human subjects must meet the requirements of the Common Rule for the Protection of Human Subjects ("Common Rule"), codified for the Department of Commerce (DOC) at 15 C.F.R. Part 27. In addition, any such proposal that includes research on these topics must be in compliance with any statutory requirements imposed upon the Department of Health and Human Services (DHHS) and other Federal agencies regarding these topics, all regulatory policies and guidance adopted by DHHS, the Food and Drug Administration, and other Federal agencies on these topics, and all Executive Orders and Presidential statements of policy on these topics.

NOAA reserves the right to make an independent determination of whether a proposer's research involves human subjects. If NOAA determines that your research project involves human subjects, you will be required to provide additional information for review and approval. If an award is issued, no research activities involving human subjects shall be initiated or costs incurred under the award until the NOAA CO issues written approval. Retroactive approvals are not permitted.

NOAA will accept proposals that include research activities involving human subjects that have been or will be approved by an Institutional Review Board (IRB) currently registered with the Office for Human Research Protections (OHRP) within the DHHS and that will be performed by entities possessing a currently valid Federal wide Assurance (FWA) on file from OHRP that is appropriately linked to the cognizant IRB for the protocol. NOAA will not issue a single project assurance (SPA) for any IRB reviewing any human subjects protocol proposed to NOAA.

Information regarding how to apply for an FWA and register an IRB with OHRP can be found at http://www.hhs.gov/ohrp/assurances/index.html.

Generally, NOAA does not fund research involving human subjects in foreign countries. NOAA will consider, however, the use of **preexisting** tissue, cells, or data from a foreign source on a limited basis if all of the following criteria are satisfied:

(1) the scientific source is considered unique,

(2) an equivalent source is unavailable within the United States,

(3) an alternative approach is not scientifically of equivalent merit, and

(4) the specific use qualifies for an exemption under the Common Rule.

Any award issued by NOAA is required to adhere to all Presidential policies, statutes, guidelines and regulations regarding the use of human embryonic stem cells. The DOC follows the NIH Guidelines by supporting and conducting research using only human embryonic stem cell lines that have been approved by NIH in accordance with the NIH Guidelines. Detailed information regarding NIH Guidelines for stem cells is located on the NIH Stem Cell Information website: http://stemcells.nih.gov. The DOC will not support or conduct any type of research that the NIH Guidelines prohibit NIH from funding. The DOC will review research using human embryonic stem cell lines that it supports and conducts in accordance with the Common Rule and NOAA implementing procedures, as appropriate.

Any request to support or conduct research using human embryonic stem cell lines not currently approved by the NIH, will require that the owner, deriver or licensee of the human embryonic stem cell line apply for and receive approval of the registration of the cell line through the established NIH application procedures: http://hescregapp.od.nih.gov/NIH_Form_2890_Login.htm. Due to the timing uncertainty associated with establishing an embryonic stem cell line in the NIH registry, the use of existing human embryonic stem cell lines in the NIH Embryonic Stem Cell Registry may be preferred by applicants or current award recipients. The NIH Embryonic Stem Cell Registry is located at: http://grants.nih.gov/stem_cells/registry/current.htm.

A proposer or current award recipient proposing to use a registered embryonic stem cell line will be required to document an executed agreement for access to the cell line with the provider of the cell line, and acceptance of any established restrictions for use of the cell line, as may be noted in the NIH Embryonic Stem Cell Registry.
If the proposal includes exempt and/or non-exempt research activities involving human subjects the following information is required in the proposal:

(1) The name(s) of the institution(s) where the research will be conducted;

(2) The name(s) and institution(s) of the cognizant IRB(s), and the IRB registration number(s);

(3) The FWA number of the applicant linked to the cognizant IRB(s);

(4) The FWAs associated with all organizations engaged in the planned research activity linked to the cognizant IRB;

(5) If the IRB review(s) is pending, the estimated start date for research involving human subjects;

(6) The IRB approval date (if currently approved for exempt or non-exempt research);

(7) If any FWAs or IRB registrations are being applied for, that should be clearly stated.

Additional documentation may be requested, as warranted, during review of the proposal, but may include the following for research activities involving human subjects that are planned in the first year of the award:

(1) A signed (by the study principal investigator) copy of each applicable final IRB-approved protocol;

(2) A signed and dated approval letter from the cognizant IRB(s) that includes the name of the institution housing each applicable IRB, provides the start and end dates for the approval of the research activities, and any IRB-required interim reporting or continuing review requirements;

(3) A copy of any IRB-required application information, such as documentation of approval of special clearances (i.e. biohazard, HIPAA, etc.) conflict-of-interest letters, or special training requirements;

(4) A brief description of what portions of the IRB submitted protocol are specifically included in the proposal submitted to NOAA, if the protocol includes tasks not applicable to the proposal, or if the protocol is supported by multiple funding sources. For protocols with multiple funding sources, NOAA will not approve the study without a nonduplication-of-funding letter indicating that no other federal funds will be used to support the tasks proposed under the proposed research or ongoing project;

(5) If a new protocol will only be submitted to an IRB if an award from NOAA issued, a draft of the proposed protocol may be requested;

(6) Any additional clarifying documentation that NOAA may request during review of proposals to perform the NOAA administrative review of research involving human subjects.

2.2.2 IRB Education Documentation

A signed and dated letter is required from the Organizational Official who is authorized to enter into commitments on behalf of the organization documenting that appropriate IRB education has been received by the Organizational Official, the IRB Coordinator or such

person that coordinates the IRB documents and materials if such a person exists, the IRB Chairperson, all IRB members and all key personnel associated with the proposal. The NOAA requirement of documentation of education is consistent with NIH notice OD-00-039 (June 5, 2000). Although NOAA will not endorse an educational curriculum, there are several curricula that are available to organizations and investigators which may be found at: http://grants.nih.gov/grants/guide/notice-files/NOT-OD-00-039.html.

2.3 Research Projects Involving Vertebrate Animals

Any proposal that includes research involving live vertebrate animals must be in compliance with the National Research Council's "Guide for the Care and Use of Laboratory Animals," which can be obtained from National Academy Press, 500 5th Street, N.W., Department 285, Washington, DC 20055. In addition, such proposals must meet the requirements of the Animal Welfare Act (7 U.S.C. § 2131 et seq.), 9 C.F.R. Parts 1, 2, and 3, and if appropriate, 21 C.F.R. Part 58. These regulations do not apply to proposed research using preexisting images of animals or to research plans that do not include live animals that are being cared for, euthanized, or used by the project participants to accomplish research goals, teaching, or testing. These regulations also do not apply to obtaining animal materials from commercial processors of animal products or to animal cell lines or tissues from tissue banks.

NOAA reserves the right to make an independent determination of whether your research involves live vertebrate animals. If NOAA determines that your research project involves live vertebrate animals, you will be required to provide additional information for review and approval. If an award is issued, no research activities involving live vertebrate animals subjects shall be initiated or costs incurred under the award until the NOAA CO issues written approval.

If the proposal includes research activities involving live vertebrate animals, the following information is required in the proposal:

(1) The name(s) of the institution(s) where the animal research will be conducted;

(2) The assurance type and number, as applicable, for the cognizant Institutional Animal Care and Use Committee (IACUC) where the research activity is located. [For example: Animal Welfare Assurance from the Office of Laboratory Animal Welfare (OLAW) should be indicated by the OLAW assurance number, i.e. A-1234; a USDA Animal Welfare Act certification should be indicated by the certification number i.e. 12-R-3456; and an Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) should be indicated by AAALAC.]

(3) The IACUC approval date (if currently approved);

(4) If the review by the cognizant IACUC is pending, the estimated start date for research involving vertebrate animals;

(5) If any assurances or IACUCs need to be obtained or established, that should be clearly stated.

Additional documentation will be requested, as warranted, during review of the proposal, but may include the following for research activities involving live vertebrate animals that are planned in the first year of the award:

(1) A signed (by the Principal Investigator) copy of the IACUC approved Animal Study Proposal (ASP);

(2) Documentation of the IACUC approval indicating the approval and expiration dates of the ASP; and

(3) If applicable, a nonduplication-of-funding letter if the ASP is funded from several sources.

(4) If a new ASP will only be submitted to an IACUC if an award from NOAA issued, a draft of the proposed ASP may be requested.

(5) Any additional clarifying documentation that NOAA may request during review of proposals to perform the NOAA administrative review of research involving live vertebrate animals.

2.4 Funding Agreement Addendums

2.4.1 SBIR Funding Agreement Certification

SBIR Funding Agreement Certification

All small businesses must complete this certification with their proposal submission and any other time set forth in the funding agreement that is prior to performance of work under this award. This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to determine whether the business is eligible for a Small Business Innovation Research (SBIR) Program award. A similar certification will be used to ensure continued compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, SBA regulations (13 C.F.R. part 121), the SBIR Policy Directive and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business may not meet certain eligibility requirements at the time of award, they are required to file a size protest with the U.S. Small Business Administration (SBA), who will determine eligibility. At that time, SBA will request further clarification and supporting documentation in order to assist in the verification of any of the information provided as part of a protest. If the funding agreement officer believes, after award, that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided.

Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil, or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that (all boxes must be checked):

(1) The business concern meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

[_] Yes [_] No

(2) If a corporation, all corporate documents (articles of incorporation and any amendments, articles of conversion, by-laws and amendments, shareholder meeting minutes showing director elections, shareholder meeting minutes showing officer elections, organizational meeting minutes, all issued stock certificates, stock ledger, buy-sell agreements, stock transfer agreements, voting agreements, and documents relating to stock options, including the right to convert non-voting stock or debentures into voting stock) evidence that it meets the ownership and control requirements set forth in 13 C.F.R. § 121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(3) If a partnership, the partnership agreement evidences that it meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(4) If a limited liability company, the articles of organization and any amendments, and operating agreement and amendments, evidence that it meets the ownership and control requirements set forth in 13 C.F.R §121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(5) The birth certificates, naturalization papers, or passports show that any individuals it relies upon to meet the eligibility requirements are U.S. citizens or permanent resident aliens in the United States.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(6) It has no more than 500 employees, including the employees of its affiliates.

[_] Yes [_] No

(7) SBA has not issued a size determination currently in effect finding that this business concern exceeds the 500 employee size standard.

[_] Yes [_] No

(8) During the performance of the award, the principal investigator will spend more than one half of his/her time as an employee of the awardee or has requested and received a written deviation from this requirement from the funding agreement officer.

[_] Yes [_] No [_] Deviation approved in writing by funding agreement officer: _____%

(9) All, essentially equivalent work, or a portion of the work proposed under this project (check the applicable line):

[_] Has not been submitted for funding by another Federal agency.
[_] Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
[_] A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.

(10) During the performance of award, it will perform the applicable percentage of work unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research
[_] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%

(11) During performance of award, the research/research and development will be performed in the United States unless a deviation is approved in writing by the funding agreement officer.

[_] Yes [_] No [_] Waiver has been granted

(12) During performance of award, the research/research and development will be performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.

[_] Yes [_] No

(13) It has registered itself on SBA's database as majority-owned by venture capital operating companies, hedge funds, or private equity firms.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(14) It is a Covered Small Business Concern [a small business concern that: (a) was not majority-owned by multiple venture capital operating companies (VCOCs), hedge funds, or

private equity firms on the date on which it submitted an application in response to an SBIR solicitation; and (b) on the date of the SBIR award, which is made more than 9 months after the closing date of the solicitation, is majority-owned by multiple venture capital operating companies, hedge funds, or private equity firms].

[_] Yes [_] No

[_] It will notify the Federal agency immediately if all or a portion of the work authorized and funded under this award is subsequently funded by another Federal agency.

[_] I understand that the information submitted may be given to Federal, State, and local agencies for determining violations of law and other purposes.

[_] I am an officer of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern that the information provided in this certification, the application, and all other information submitted in connection with this application, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 et seq.); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 et seq.); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and nonprocurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

_____ _____
Signature Date

_____
Print Name (First, Middle, Last)

_____
Title

_____
Business Name

2.4.2 SBIR Funding Agreement Certification – Life Cycle Certification

All SBIR Phase I and Phase II awardees must complete this certification at all times set forth in the funding agreement (see §8(h) of the SBIR Policy Directive). This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to ensure compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, the SBIR Policy Directive, and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided.

Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil, or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that (<u>all boxes must be checked</u>):

(1) The principal investigator spent more than one half of his/her time as an employee of the awardee or the awardee has requested and received a written deviation from this requirement from the funding agreement officer.

[_] Yes [_] No [_] Deviation approved in writing by funding agreement officer: _____%

(2) All, essentially equivalent work, or a portion of the work performed under this project (check the applicable line):

[_] Has not been submitted for funding by another Federal agency.
[_] Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
[_] A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.

(3) Upon completion of the award it will have performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research

[_] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%

(4) The work is completed and it has performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research
[_] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%
[_] N/A because work is not completed

(5) The research/research and development is performed in the United States unless a deviation is approved in writing by the funding agreement officer.

[_] Yes [_] No [_] Waiver has been granted

(6) The research/research and development is performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.

[_] Yes [_] No

[_] It will notify the Federal agency immediately if all or a portion of the work authorized and funded under this award is subsequently funded by another Federal agency.

[_] I understand that the information submitted may be given to Federal, State, and local agencies for determining violations of law and other purposes.

[_] I am an <u>officer</u> of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern that the information provided in this certification, the application, and all other information submitted in connection with the award, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 et seq.); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 et seq.); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and nonprocurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

_____ _____

Signature Date

_____

Print Name (First, Middle, Last)

_____

Title

_____

Business Name

3.0 PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

3.1 Proposal Requirements

NOAA reserves the right not to complete a technical review of any proposal which it determines has insufficient scientific and technical information, or one which fails to comply with the administrative procedures as outlined in the NOAA/SBIR Checklist in Section 9.7. Proposals that do not pass the screening criteria (outlined in Section 4.2) will be rejected without further consideration.

The offeror must provide sufficient information to demonstrate that the proposed work represents a sound approach to the investigation of an important scientific or engineering innovation. The proposal must meet all the requirements of the subtopic in Section 8 to which it applies.

A proposal must be self-contained and written with all the care and thoroughness of a scientific paper submitted for publication. It should indicate a thorough knowledge of the current status of research in the subtopic area addressed by the proposal. Each proposal should be checked carefully by the offeror to ensure inclusion of all essential material needed for a complete evaluation. The proposal will be peer reviewed as a scientific paper. All units of measurement should be in the metric system.

The proposal must not only be responsive to the specific NOAA program interests described in Section 8 of the solicitation, but also serve as the basis for technological innovation leading to **new commercial products, processes, or services.** An organization may submit different proposals on different subtopics or different proposals on the same subtopic under this Solicitation. When the proposed innovation applies to more than one subtopic, the offeror must choose that subtopic which is most relevant to the offeror's technical concept.

Proposals principally for the commercialization of proven concepts or for market research shall not be submitted for Phase I funding, since such efforts are considered the responsibility of the private sector.

The proposal should be direct, concise, and informative. Promotional and other material not related to the project shall be omitted.

NOAA will notify the various offerors whether they have been recommended for a potential award within 90 calendar days of the closing date of this solicitation. If selected for potential award and approved by the CO, the offeror can anticipate receiving an actual award within 180 calendar days of the closing date of the solicitation. The offeror shall **not** proceed with work until an official award is received.

3.2 Phase I Proposal Limitations

- Page Length - **no more than 25 pages**, consecutively numbered, including the cover page, project summary, main text, references, resumes, other applicable technical enclosures or attachments, and the Proposed Budget (Section 9.3). The only exceptions to the page count limitation are the additional Supplemental Budget Documentation for the Proposed Budget (See Section 9.4 for a more detailed discussion); SBIR Funding Agreement Certification (Form 9.5); SBIR.gov Company Registry documentation (see Section 3.3.2); and those pages necessary to comply with the itemization of prior SBIR Phase II awards, per Section 3.5. No additional attachments, appendices, or references beyond the 25 page limitation shall be considered in the technical proposal evaluation.

- Paper Size - must be standard size (21.6 cm X 27.9 cm; 8 ½" X 11").

- Format - must be easy to read with a font of at least 10 point. Margins should be at least 2.5cm / 0.984".

Supplementary material, revisions, substitutions, audio or video tapes, or other electronic media will **not** be accepted.

Proposals not meeting these requirements will be rejected without further review.

3.3 Phase I Proposal Submission Forms and Technical Content

This section includes instructions for completing required forms and writing the Technical Content section. A complete proposal application must include:

Technical Proposals: **Two (2) copies** of each of the following (not to exceed a total of 25 printed pages):

(a) Cover Page (front and back counted as one page, required form, see Section 3.3.1 and 9.1)
(b) Project Summary (required form, see Section 3.3.3 and 9.2)
(c) Technical Content (up to 22 pages, see Section 3.3.4)
(d) Proposed Budget (required form, see Section 3.6 and 9.3)

Supplemental Budget and Other Information: **Two (2) copies** of each of the following (not counted towards 25 page limit):

(a) Supplemental Budget documentation (required, see Section 9.4)
(b) SBIR Funding Agreement Certification (required form, see Section 9.5)
(c) Screen shot or similar copy of proposers' Company Registry as noted on SBIR.gov website (required, see Section 3.3.2)

(d) List of prior Phase II awards for proposers awarded more than 15 SBIR Phase II awards in the prior five fiscal years (required, if applicable, see Section 3.5).

Proposals received missing any of these required items will be rejected without further review. For instructions on proposal submission, see Section 6.2.

3.3.1 Proposal Cover Sheet

Complete all items in the "Cover Page" (front and back side) required form and use as page 1 of the proposal. Ensure that required signatures are included. The government may reject any unsigned offers received. **NO OTHER COVER PAGE WILL BE ACCEPTED.**

If you check the Yes box on #7 of the Cover Sheet, your contact information will be provided to National Institute of Standards and Technology (NIST) Hollings Manufacturing Extension Partnership (MEP). You may be contacted by your local MEP to explore business-related support services that could benefit the potential of the project you proposed.

Before NOAA can award a contract to a successful offeror under this solicitation, the offeror must be registered in the System for Award Management (SAM). To register, visit https://www.sam.gov/portal/public/SAM/ or call 1-866-606-8220. This procurement shall be awarded as a "contract" and not a "grant." Within SAM.gov, you must complete the Representations and Certifications Section and include the North American Industry Classification System (NAICS) code 541712 with your registration.

The Data Universal Numbering System (DUNS) number is a nine-digit number assigned by Dun and Bradstreet Information Services. If the offeror does not have a DUNS number, it should contact Dun and Bradstreet directly to obtain one. A DUNS number will be provided immediately by telephone at no charge to the offeror. For information on obtaining a DUNS number, the offeror, if located within the United States, should call Dun and Bradstreet at 1-866-705-5711, or access their website at http://fedgov.dnb.com/webform.

No award shall be made under this solicitation to a small business concern without proper registration in SAM.

Small Business Concerns may also be able to obtain free to low cost assistance with the SAM.gov website through their local state Procurement Technical Assistance Centers (PTAC). Information can be obtained at http://www.aptac-us.org.

Be sure to identify proposal page numbers that contain confidential information in the Proprietary Notice section at the end of the Cover Sheet.

3.3.2 Data Collection Requirement

Each Phase I and Phase II applicant is required to provide information for SBA's database (www.SBIR.gov). The following are examples of the data to be entered by applicants into the database:

- Any business concern or subsidiary established for the commercial application of a product or service for which an SBIR award is made.
- Revenue from the sale of new products or services resulting from the research conducted under each Phase II award.
- Additional investment from any source, other than Phase I or Phase II awards, to further the research and development conducted under each Phase II award.
- Update the information in the database for any prior Phase II award received by the SBC. The SBC may apportion sales or additional investment information relating to more than one Phase II award among those awards, if it notes the apportionment for each award.

Each Phase II awardee is required to update appropriate information on the award in the database upon completion of the last deliverable under the funding agreement and is requested to voluntarily update the information in the database annually thereafter for a minimum period of 5 years.

3.3.3 Project Summary

Complete all sections of the "Project Summary" form and use as page 2 of your proposal. The technical abstract should include a brief description of the problem or opportunity, the innovation, project objective, and technical approach.

In summarizing anticipated results, include technical implications of the approach and the potential commercial applications of the research. **Each awardee's Project Summary will be published on the NOAA SBIR website and, therefore, must NOT contain proprietary information.**

3.3.4 Technical Content

Beginning on page 3 of the proposal, the following sections are required: **(All headings must be included. If a particular section does not apply, please include the heading, followed by N/A)**

(a) **Identification and Significance of the Problem or Opportunity.** Make a clear statement of the specific research problem, technical problem, or opportunity addressed. Indicate its innovativeness, commercial potential, and why it is important. Show how it applies to one of the specific subtopics in Section 8.

(b) **Phase I Technical Objectives.** State the specific objectives of the Phase I research or R&D effort, including the technical questions it will try to answer to determine the feasibility of the proposed approach.

(c) **Phase I Work Plan.** Include a detailed description of the Phase I research or R&D plan. The plan should indicate not only what will be done, *but also* where it will be done and how the research will be carried out. The method(s) planned to achieve each objective or task, mentioned in item (b) above, should be discussed in detail. In most cases, **this section is typically at least one-third of the proposal.**

(d) **Related Research or R&D.** Describe research or R&D that is directly related to the proposal including any conducted by the principal investigator or by the proposer's firm. Describe how it relates to the proposed effort, and describe any planned coordination with outside sources. **The purpose of this section is to demonstrate the offeror's awareness of recent developments in the specific topic.**

(e) **Key Individuals and Bibliography of Related Work.** Identify key individuals involved in Phase I, including their directly related education, experience, and bibliographic information. Where vitae are extensive, summaries that focus on most relevant experience or publications are desired and may be necessary to meet proposal size limitation. List all other commitments that key personnel have during the proposed period of contract performance.

(f) **Relationship with Future R&D.** Discuss the significance of the Phase I effort in providing a foundation for the Phase II R&D effort. Also state the anticipated results of the proposed approach, if Phases I and II of the project are successful.

(g) **Facilities and Equipment.** The conduct of advanced research may require the use of sophisticated instrumentation or computer facilities. The proposer should provide a detailed description of the availability and location of the facilities and equipment necessary to carry out Phase I. NOAA facilities and/or equipment will be available for use by awardees only if specifically provided for in the subtopic description. All related transportation/shipping/insurance costs shall be the sole responsibility of the contractor. If expressed in the subtopic description that access to NOAA resources will be made available, then under mutual agreement between awardee and NOAA staff, arrangements will be planned prior to NOAA labs visits, samples testing or exchange, and any collaborative discussions.

(h) **Consultants and Subcontracts.** The purpose of this section is to show NOAA that: (1) research assistance from outside the firm materially benefits the proposed effort, and (2) arrangements for such assistance are in place at the time of proposal submission.

Outside involvement in the project is encouraged where it strengthens the conduct of the research. Outside involvement is not a requirement of this solicitation and is limited to no more than 1/3 of the research and/or analytical effort in Phase I.

1. Consultant – A person outside the firm, named in the proposal as contributing to the research, must provide a signed statement confirming his/her availability and role in the project. Additionally, it should document the total amount anticipated with hours and an agreed consulting rate for participation in the project. This statement is part of the page count.
2. Subcontract – Similarly, where a subcontract is involved in the research, the subcontracting institution must furnish a letter signed by an appropriate official describing the programmatic arrangements and confirming its agreed participation in the research. This letter is part of the page count. The proposed budget for this participation shall be included in the Supplemental Budget Documentation section and does not contribute to the 25 page count limitation.

No individual or entity may serve as a consultant or subcontractor if they:

1. Had any role in suggesting, developing, or reviewing the subtopic; or
2. Have been the recipient of any information on the subtopic not available to the public.

(i) **Potential Commercial Applications and Follow-on Funding Commitment.** Describe in detail the commercial potential of the proposed research, how commercialization would be pursued, benefits over present products on the market, and potential use by the Federal Government. Address the following:

1. Market opportunity – Describe the current and anticipated target market, the size of the market, and include a brief profile of the potential customer.
2. Technology and competition – Describe the competitive landscape, the value proposition and competitive advantage of the product or service enabled by the proposed innovation. Also include what critical milestones must be met to get the product or process to market and the resources required to address the business opportunity.
3. Finances – Describe your strategy for financing the innovation.

(j) **Cooperative Research and Development Agreements (CRADA).** State if the applicant is a current CRADA partner with NOAA, or with any other Federal agency, naming the agency, title of the CRADA, and any relationship with the proposed work. An Agency may NOT enter into, nor continue, a CRADA with an awardee on the subtopic of the award.

(k) **Guest Researcher.** State if the offeror or any of its consultants or subcontractors is a guest researcher at NOAA, naming the sponsoring laboratory.

(l) **Cost Sharing.** Cost-sharing is permitted for proposals under this program solicitation; however, cost-sharing is not required. Cost-sharing will not be an evaluation factor in consideration of your Phase I proposal.

3.4 Similar Proposals or Awards. *** WARNING ***

While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially equivalent work for consideration under numerous Federal program solicitations, **it is unlawful to enter into funding agreements requiring essentially equivalent work.** If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

If an applicant elects to submit identical proposals or proposals containing significant amount of essentially equivalent work under other Federal program solicitations, a statement must be included in each such proposal indicating:

(a) the name and address of all agencies to which a proposal was submitted or from which awards were received;

(b) the date of proposal submission or date of award;

(c) the title, number, and date of solicitation(s) under which a proposal(s) was submitted or award(s) received;

(d) the specific applicable research topic for each proposal submitted or award received;

(e) the title of the research project; and

(f) the name and title of the principal investigator or project manager for each proposal submitted or award received.

If no equivalent proposal is under consideration or equivalent award received, a statement to that effect **must** be included in this section of the technical content area of the proposal and certified within the Cover Page.

3.5 Prior SBIR Phase II Awards

If a small business concern has received more than 15 SBIR Phase II awards from any of the Federal agencies in the prior five (5) fiscal years, it must submit as an attachment to its Phase I proposal the following list of items: name of awarding agency; date of award; funding agreement number; amounts of award; topic or subtopic title; follow-on agreement amount; source and date of commitment; and current commercialization status for each Phase II. The offeror shall document the extent to which it was able to secure Phase III funding to develop concepts resulting from previous Phase II SBIR Awards. **This required information shall <u>not</u> be considered part of the Phase I page count limitation.**

3.6 Proposed Budget

Complete the "NOAA SBIR Proposed Budget" (See Section 9.3) for the Phase I effort and include it as the last page of the technical proposal. Verify the total request is accurate and does **not exceed $95,000**. Proposals exceeding $95,000.00 shall be automatically rejected. The Proposed Summary Budget must be signed by the Corporate Official. Some items of the form under Section 9.3 may not apply to every proposal. Additionally, some firms may have different accounting practices for their overhead rates. Offerors should use indirect rates consistent with their own accounting system, even if different from the rate categories shown on the form. These differences should be discussed in the Supplemental Budget Documentation. Enough information, though, should be provided on the Proposed Budget to allow NOAA to understand how the offeror plans to use the requested funds if the award is considered. A complete cost breakdown should be provided giving direct costs, indirect costs, other direct costs G&A, and profit. The offeror is to submit a cost estimate with detailed information consistent with the offeror's cost accounting system. A reasonable profit will be allowed.

As a reminder in completing the Proposal Budget Summary for Phase I, a minimum of two-thirds of the research and/or analytical effort must be performed by the proposing small business concern. The total cost for all consultant fees, facility leases, usage fees, and other subcontract or purchase agreements may not exceed one-third of the contract price. For Phase II, a minimum of one-half of the research and/or analytical effort must be performed by the proposing small business concern. The total cost for all consultant fees, facility leases, usage fees, and other subcontract or purchase agreements may not exceed one-half of the contract price.

Offerors shall provide additional supplemental budget documentation for the Proposed Budget for the Government's Cost and Pricing Review. ***This Supplemental Budget Documentation shall NOT be utilized for evaluation of the Technical Proposal. Offerors must ensure that all relevant technical information is included within the 25 page technical proposal.*** The Supplemental Budget Documentation does **NOT** count towards the 25 page count requirement. Additionally, the government **only requires two (2) hard copies** of the Supplemental Budget Documentation. The Supplemental Budget Documentation shall include a cover sheet and be organized, stapled, and easy to understand. The information should only supplement and help to justify and explain the amounts requested on the Proposed Budget sheet. Additionally, the documentation should indicate any known or anticipated source, quantity, unit price, competition obtained, and basis used to establish source and reasonable costs (e.g. other direct costs, equipment, and travel, etc.).

A more detailed discussion of completing the Proposed Budget and the Supplemental Budget Documentation is provided in Section 9.4.

3.7 Multiple Proposals

Offerors may submit multiple proposals to this solicitation. Offerors should submit separate proposal packages for each topic area they wish to be considered. If offerors have multiple proposals with different methods or deliverables that they wish to propose on the same topic area, a separate proposal package should be provided for each method or deliverable.

4.0 METHOD OF SELECTION AND EVALUATION CRITERIA

4.1 Introduction

All Phase I and II proposals will be evaluated and judged on a competitive basis. **A proposal will not be deemed acceptable if it represents presently available technology.** Proposals will be initially screened to determine responsiveness (See Section 4.2 and 9.7). Proposals passing this initial screening will be technically evaluated by engineers or scientists (reviewers may be NOAA employees or outside of NOAA) to determine the most promising technical and scientific approaches. Each proposal will be judged on its own merit. NOAA is under no obligation to fund any proposal or any specific number of proposals in a given topic. It also may elect to fund several or none of the proposed approaches to the same topic or subtopic.

4.2 Phase I Screening Criteria

Phase I proposals that do not satisfy all of the screening criteria shall be rejected without further review and will be eliminated from consideration for award. Rejected proposals may not be resubmitted (with or without revision) under this solicitation. The screening criteria (also see Section 9.7) are:

(a) The proposing firm must qualify as a small business, in accordance with Section 1.7.14.

(b) The Phase I proposal must meet **all** of the requirements stated in Section 3.

(c) The Phase I proposal must be limited to one subtopic and clearly address research for that subtopic.

(d) Phase I proposal budgets must not exceed $95,000.

(e) The project duration for the Phase I feasibility research must not exceed six months.

(f) The proposing firm must carry out a minimum of two-thirds of expenditures under each Phase I project.

(g) All work must be performed by the small business concern and its subcontractors in the United States, unless a waiver has been granted in advance by the CO (see Section 1.5).

(h) The proposal must contain information sufficient to be peer reviewed as research.

4.3 Phase I Evaluation and Selection Criteria

Phase I proposals that comply with the screening criteria will go through the following process:

Step 1: The proposals will be evaluated by internal NOAA and/or external scientists or engineers via peer review in accordance with the following criteria:

(1) The technical approach and the anticipated agency and commercial benefits that may be derived from the research (25 points).

(2) The adequacy of the proposed effort and its relationship to the fulfillment of requirements of the research subtopic (15 points).

(3) The level of innovation the proposed effort offers to the research subtopic (20 points).

(4) Consideration of a proposal's commercial potential as evidenced by the SBC's Commercialization Plan (25 points).

(5) Qualifications of the proposed principal/key investigators, supporting staff, and consultants (15 points).

Technical reviewers will base their rankings on information contained in the proposal. It is assumed that reviewers are not acquainted with any experiments referred to, key individuals, or the firm. No technical clarifications may be made after proposal submission.

Step 2: A NOAA-wide selection panel will review the content of the proposals based on the following evaluation factors to develop a final ranking:

(1) Proposal priority ranking resulting from Step 1.

(2) Economic impact (e.g., ability of the company to develop a commercially viable product, service or process); number and record of past performance for SBIR and STTR awards; consideration given to companies without previous SBIR awards; existence of outside non-SBIR funding or partnering commitments; and/or the presence of other relevant supporting material contained in the proposal that indicates the commercial potential of the idea (such as letters of support, journal articles, literature, Government publications, etc.).

Final award recommendation decisions will be made by NOAA based upon rankings assigned by the selection panel and consideration of additional factors, **including possible duplication of other research**, the importance of the proposed research as it relates to NOAA needs, and the availability of funding. In the event of a "tie" between proposals, manufacturing-related projects as well as those regarding energy efficiency and renewable energy systems will receive priority in the award selection process. NOAA may elect to fund several or none of the proposals received on a given subtopic. Upon recommendation of a proposal for a Phase I award, NOAA reserves the right to review and negotiate, if necessary, the amount of the award.

4.4 Phase II Evaluation and Selection Criteria

During the feasibility study project performance period, Phase I awardees will be provided instructions for preparation and submission of Phase II proposals. Phase II proposals that comply with the screening criteria as stated in those instructions will be evaluated by NOAA and external scientists and engineers in accordance with the step 1 and 2 evaluation criteria.

Upon selection of a proposal for Phase II award, NOAA reserves the right to review and negotiate, if necessary, the amount of the award. NOAA is not obligated to fund any specific Phase II proposal.

4.5 Release of Proposal Review Information

Notifications to the various offerors of recommendations of potential selection or non-selection of award that passed the screening criteria, will be advised within 90 calendar days of closing of the solicitation. Copies of the technical evaluations shall be provided tentatively 30 days after completion of potential selection or non-selection of award. The identity of the reviewers will not be disclosed.

5.0 CONSIDERATIONS

5.1 Awards

NOAA will award firm-fixed price contracts to successful offerors for both Phase I and II. A firm-fixed price contract identifies a price that is not subject to any adjustment on the basis of the contractor's cost expenditure in performing the effort. This agreement type places upon the contractor the risk and full responsibility for all costs and resulting profit or loss. It provides maximum incentive for the contractor to control costs and perform effectively and imposes a minimum administrative burden upon both parties. NOAA also does not allow any advance payments to be made on its awards. The firm-fixed price shall be inclusive of all transportation/shipping/insurance costs for government furnished property (if requested in the

proposal and accepted by the government) made available for use by awardee and all deliverables/prototypes to be furnished to NOAA.

Contingent upon availability of funds, NOAA anticipates making approximately **eight (8) to ten (10)** Phase I firm-fixed price contracts of no more than **$95,000** each. Total performance period shall be no more than six (6) months. Historically, NOAA has funded about ten percent of the Phase I proposals submitted.

Phase II awards shall be for no more than $400,000. The period of performance to complete Phase II effort will depend upon the scope of the research, but the final report due date must not exceed 24 months. One year after completing the R&D activity, the awardee shall be expected to report on their commercialization activities. The total period of performance for Phase II is anticipated to be approximately 36 months.

It is anticipated that **approximately half of the Phase I awardees will receive Phase II awards**, depending upon the availability of funds. To provide for an in-depth review of the Phase I final report and the Phase II proposal and commercialization plan, Phase II awards will be made approximately five months after the completion of Phase I.

For planning purposes, proposers should understand that Phase I awards are tentatively issued in July 2015, Phase II proposals are due approximately March 2016 and Phase II awards are issued tentatively June 2016.

This Solicitation does not obligate NOAA to make any awards under either Phase I or Phase II. Furthermore, NOAA is not responsible for any monies expended by the proposer before award of any contract resulting from this Solicitation.

5.2 Reports

Phase I awardees will be required to submit two progress reports and a final report. Phase I reports are due at 2, 4, and 6 months after award.

Phase II awardees will be required to submit four progress reports, a final report, and a commercialization report. Phase II reports are due at 2, 6, 12, 18, and 24 months, or as to be negotiated on a case by case basis. The commercialization report is due 36 months after award. The payment schedule in paragraph 5.3 is tied to these reports.

Phase I and Phase II progress reports should be brief letter reports and include all technical details regarding the research conducted up to that point in the project and will provide detailed plans for the next stages of the project. The acceptance of each progress report will be contingent upon appropriate alignment with the solicited and proposed milestones. Consideration will be given to changes from the solicited and proposed milestones if results from experimentation warrant a deviation from plan. Inclusion of proprietary information within the progress reports and final report may be necessary in order to effectively communicate

progress and gain appropriate consultation from NOAA experts regarding next steps. All such proprietary information will be marked according to instructions provided in Section 5.5.

Final reports submitted under Phase I and Phase II shall include a single-page project summary as the first page, identifying the purpose of the research, and giving a brief description of the research carried out, the research findings or results, and the commercial applications of the research in a final paragraph. The remainder of the report should indicate in detail the research objectives, research work carried out, results obtained, and estimates of technical feasibility.

All final reports must carry an acknowledgement on the cover page such as: "*This material is based upon work supported by the National Oceanic and Atmospheric Administration (NOAA) under contract number _____. Any opinions, findings, conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of NOAA."*

The information provided in the Phase II commercialization update reports will be compiled and used as general statistics to help determine the value of NOAA SBIR Program, educate stakeholders about the outcomes and impact, and attract new entrants.

The Phase II commercialization update report shall include the following:

a. A description of the company's efforts to further develop, commercialize and derive revenues from the technology resulting from this SBIR award. These may include but are not limited to: customer/potential customer base, overview of marketing and sales strategies, other uses of knowledge gained, partners, licensing, committed resources, market readiness, use of knowledge gained for other projects, manufacturing, and financing strategy. Also discuss difficulties, and barriers to entry.

If work has ended on the project, please provide an explanation as to why (i.e. technical objective not met, existing barriers to entry, could not obtain follow-on funding, technology not economically viable, alternative technology entered the market, or other explanation).

b. Information about any follow-on funding commitment(s) and investments to further the development and/or commercialize the Phase II technology.

If follow-on funding was not obtained, provide possible reasons (i.e. technical objective not met, technology not economically viable, alternative technology entered the market, or other explanation).

c. Details about products and /or processes being developed, used for other projects, or currently in the marketplace resulting from the SBIR project.

d. A list of any patents or published patent applications resulting from the SBIR project.

e. Sales revenue from new products or processes received from the commercialization of

this SBIR project include: sales, manufacturing, product licensing, royalties, consulting, contracts, or other.

To help assess the effectiveness of our program in meeting programmatic and SBIR objectives, NOAA may periodically request information from small businesses about progress taken towards commercialization of the technology after the completion of Phase I and II contracts.

5.3 Payment Schedule

If selected for award, the government shall contact the potential awardee to confirm the appropriate amounts tied to the reports in paragraph 5.2. Typically, they have been even amounts for each payment period. The specific payment schedule (including payment amounts) for each award will be incorporated into the resulting contract.

No advance payments will be allowed. To receive an SBIR payment the SBC must re-certify that they remain eligible as SBC to receive funding and have not changed their SBC status or any other terms of condition of initial award.

For Phase II, a total of six payments, in even amounts, are anticipated to coincide with the reports except for the last payment. The sixth payment for $5,000.00 will be made after the commercialization report is accepted (see Section 5.2). Failure to submit the report within twelve months of the completion of the R&D activity period for Phase II may result in a de-obligation of the $5,000.00.

5.4 Deliverables

Offers submitted in response to subtopics that require delivery of a prototype should state in the proposal, the plan to develop and deliver the specified prototype. Shipping shall be Freight on Board (F.O.B) Destination which means that the contractor is responsible for all transportation/shipping/insurance costs for deliverables. Notwithstanding the absence of such an explicit statement in the offeror's proposal, delivery of the developed prototype as called for by the Solicitation subtopic is required.

5.5 Innovations, Inventions, and Patents

5.5.1 Proprietary Information

Information contained in unsuccessful proposals will remain the property of the proposer. Any funded proposal will not be made available to the public, except for the "Project Summary" page.

The inclusion of proprietary information within the proposal is discouraged unless it is absolutely necessary for the proper evaluation. Information contained in unsuccessful

proposals will remain the property of the offeror. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements. If proprietary information is provided by an offeror in a proposal, which constitutes a trade secret, proprietary commercial or financial information, confidential personal information or data affecting the national security, it will be treated in confidence, to the extent permitted by law. This information must be clearly marked by the offeror with the term "confidential proprietary information" and the following legend must appear on the first page of the technical section of the proposal:

> "These data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than evaluation of this proposal. If a funding agreement is awarded to this offeror as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained on pages _____ of this proposal."

Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration, without assuming any liability for inadvertent disclosure. The Government will limit dissemination of such information to its employees and, where necessary for evaluation, to outside reviewers on a confidential basis.

Examples of laws that restrict the government to protect confidential/proprietary information about business operations and trade secrets possessed by any company or participant include: Freedom of Information Act (FOIA) – 5. U.S.C. § 552(b); Economic Espionage Act – 18 U.S.C. § 1832; and Trade Secrets Act – 18 U.S. C. § 1905.

In view of the above, proposers are cautioned that proposals are likely to be less competitive if significant details are omitted due to the proposer's reluctance to reveal confidential/proprietary information.

5.5.2 Rights in Data Developed under SBIR Contracts

Except for copyrighted data, the Government shall normally have unlimited rights to data in Phase I, II, or III awards, such as:

(a) data specifically identified in the SBIR contract to be delivered without restriction;

(b) form, fit, and function data delivered under the contract;

(c) data delivered under the contract that constitute manuals or instructions and training material for installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under the contract; and

(d) all other data delivered under the contract.

To preserve the SBIR Data Rights of the awardee, the following must be affixed to any submissions of technical data developed under that SBIR award:

SBIR RIGHTS NOTICE (DEC 2007)

These SBIR data are furnished with SBIR rights under Contract No._____ (and subcontract _____, if appropriate). For a period of 4 years, unless extended in accordance with FAR 27.409(h), after acceptance of all items to be delivered under this contract, the Government will use these data for Government purposes only, and they shall not be disclosed outside the Government (including disclosure for procurement purposes) during such period without permission of the Contractor, except that, subject to the foregoing use and disclosure prohibitions, these data may be disclosed for use by support Contractors. After the protection period, the Government has a paid-up license to use, and to authorize others to use on its behalf, these data for Government purposes, but is relieved of all disclosure prohibitions and assumes no liability for unauthorized use of these data by third parties. This Notice shall be affixed to any reproductions of these data, in whole or in part.

(END OF NOTICE)

The Government's sole obligation with respect to any properly identified SBIR data shall be as set forth in the paragraph above. The five-year period of protection applies for Phases I, II, and III.

5.5.3 Copyrights

With prior written permission of the CO, the awardee normally may copyright and publish (consistent with appropriate national security considerations, if any) material developed with Government support. The Government receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgement and disclaimer statement.

5.5.4 Patents

Small business concerns normally may retain the worldwide patent rights to any invention made with Government support. In such circumstances, the Government receives a royalty-free license for Federal Government use, reserves the right to require the patent holder to license others in certain circumstances, and may require that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, the government will not make public any information disclosing a Government-supported invention for a minimum 4-year period (that may be extended by subsequent SBIR funding agreements) to allow the awardee a reasonable time to pursue a patent.

5.5.5 Invention Reporting

SBIR awardees must report inventions to the NOAA SBIR Program within two months of the inventor's report to the awardee. The reporting of patents and other patent obligations shall be completed through the iEdison System unless noted in resulting contract. For additional information on the iEdison System go to https://s-edison.info.nih.gov/iEdison/.

5.6 Considerations

Upon award of a funding agreement, the contractor will be required to make certain legal commitments through acceptance of numerous clauses in Phase I funding agreements. The outline that follows is illustrative of the types of clauses to which the contractor would be committed. This list is not a complete list of clauses to be included in Phase I funding agreements, and is not the specific wording of such clauses. Copies of complete terms and conditions are available upon request.

(a) Standards of Work. Work performed under the contract must conform to high professional standards.

(b) Inspection. Work performed under the contract is subject to Government inspection and evaluation at all reasonable times.

(c) Examination of Records. The Comptroller General (or a duly authorized representative) shall have the right to examine pertinent records of the contractor involving transactions related to this contract.

(d) Default. The Government may terminate the agreement if the contractor fails to perform the work contracted.

(e) Termination for Convenience. The Government may terminate the contract at any time if it deems termination to be in the best interest, in which case the contractor will be compensated for work performed and for reasonable termination costs.

(f) Disputes. Any dispute concerning the contract, which cannot be resolved by agreement, shall be decided by the Contracting Officer with right to appeal.

(g) Contract Work Hours. The contractor cannot require an employee to work more than eight hours a day or 40 hours a week, unless the employee is compensated accordingly (i.e. overtime pay).

(h) Equal Opportunity. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

(i) Affirmative Action for Veterans. The contractor will not discriminate against any employee or applicant for employment because he or she is a disabled veteran or veteran of the Vietnam era.

(j) Affirmative Action for the Handicapped. The contractor will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.

(k) Officials Not to Benefit. No Government official shall benefit personally from any SBIR contract.

(l) Covenant Against Contingent Fees. No person or agency has been employed to solicit or secure the contract upon an understanding for compensation, except bona fide employees or commercial agencies maintained by the contractor for the purpose of securing business.

(m) Gratuities. The Government may terminate the contract if any gratuity has been offered to any representative of the Government to secure the contract.

(n) Patent Infringement. The contractor shall report each notice or claim of patent infringement based on the performance of the contract.

(o) American-Made Equipment and Products. When purchasing either equipment or a product, under the SBIR funding agreement, purchase only American-made items whenever possible.

5.7 Additional Information

(a) Projects. The responsibility for the performance of the principal investigator, and other employees or consultants, who carry out the proposed work, lies with the management of the organization receiving an award.

(b) Organizational Information. Before award of an SBIR contract, the Government may request the proposer to submit certain organizational, management, personnel, and financial information to assure responsibility of the proposer.

(c) **Duplicate Awards. If an award is made under this solicitation, the contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by any agency of the Federal Government. Severe penalties may result from such actions.**

(d) **Your firm is required to obtain a Dunn and Bradstreet Number (DUNS) and register in the System for Award Management (SAM) database and complete the**

Online Representations and Certifications (in order to be eligible to receive a contract award.

(e) **In addition, your firm is required to register in the SBIR database (www.SBIR.gov) and submit a copy of your firms registration information from the Company Registry**.

(f) If there is any inconsistency between the information contained herein and the terms of any resulting SBIR contract, the terms of the contract are controlling.

(g) The Government is not responsible for any monies expended by the offeror before award of any contract.

(h) NOAA may provide technical assistance to awardees as allowed by legislation.

5.8 Technical Assistance for Proposal Preparation and Project Conduct

National Institute of Standards and Technology (NIST)/Hollings Manufacturing Extension Partnership (MEP): Proposers may wish to contact the NIST Hollings MEP for manufacturing and other business-related support services. The MEP works with small- and medium-sized companies to help them create and retain jobs, increase profits, and save time and money. The nationwide network provides a variety of services, from business development assistance to innovation strategies to process improvements and the identification of commercialization opportunities. MEP is a nationwide network of locally managed extension centers with over 1,400 technical experts located in every state. To contact a MEP center, call 1-800-MEP-4MFG (1-800-637-4634) or visit MEP's website at www.mep.nist.gov.

Commercialization Assistance Program (CAP): NOAA is committed to providing assistance in commercialization planning of products, services or technologies developed by Phase I and/or Phase II awardees under the SBIR program. The NOAA Commercialization Assistance Program (CAP) is a program which can assist in the successful commercialization of these products, services or technologies developed in association with the DOC NOAA SBIR Program. The NOAA CAP may cover assistance in such areas as assessing small business commercialization needs; planning, developing, and assisting in the preparation of a Phase II commercialization plan; identifying markets and developing entry strategies; and helping determine key requirements and traits for market viable products or services.

The CAP is a mentoring and training program that includes one-on-one business counseling organized around topics that will contribute to the development of a strategic action plan, business plan, or a licensing or go-to-market strategy. Additionally, the CAP seeks to provide robust strategic and technical assistance to program participants seeking to commercialize their SBIR products initially funded by the NOAA SBIR Program.

SBIR Phase I and Phase II awardees may participate in training activities spanning a period of nine (9) months. NOAA has set aside the maximum legislatively allowed amount of funds available for CAP assistance for awardees interested in this training. The SBIR awardee has the option to not participate in this assistance effort that is available to them.

Proposers may also contact independent state, regional, or area specific resources, for example, economic development agencies for additional assistance and resources.

6.0 SUBMISSION OF PROPOSALS

6.1 Deadline for Proposals and Modifications

Deadline for Phase I proposal receipt (two copies) at the NOAA Eastern Region Acquisition Division is 4:00 p.m. (Central Time) on January 14, 2015. NOAA does not accept electronic submission of proposals.

All offerors should expect delay in mailed delivery due to added security at Federal Facilities. It is the responsibility of the offeror to make sure delivery is made on time. Walk-ins and courier deliveries are only permitted if arranged at least one business day in advance.

Offerors are responsible for submitting proposals that adhere to the requirements of the solicitation (see Section 9.7 NOAA/SBIR Checklist) so as to reach the government office by the time specified in the solicitation.

Any proposal that is received after the exact time specified for receipt of proposals is "late" and will not be considered.

Late proposals and their modifications that are not considered shall be held unopened, unless for identification, until after award and then shall be retained with other unsuccessful proposals.

Modifications to proposals may be submitted at any time **before** the solicitation closing date and time, which includes responses to an amendment or correcting a mistake. For modifications, the offeror shall provide new proposals with a cover letter indicating that it is replacing a previously submitted proposal. A late modification of an otherwise successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted. Revised proposals may only be submitted when requested or allowed by the CO. Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the CO.

Letters of instruction will be sent to Phase I awardees (e.g. completed Phase I within the required time frame) to submit Phase II proposals. The Phase II proposals are due after

receipt of the Phase I Final Report, approximately eight months after commencement of the Phase I contract.

Offerors are cautioned of unforeseen delays that can cause late arrival of proposals at NOAA, resulting in them not being included in the evaluation procedures. No information on the status of proposals under scientific/technical evaluation will be available until formal notification is made.

6.2 Proposal Submission

Two (2) hard copies of each set of proposals (which includes the Technical Proposal and the Supplemental Budget and Other Information) must be received no later than 4:00 pm (CST) on January 14, 2015. Proposals are to be mailed to:

DOC/NOAA – EAD-KC
ATTN: SBIR Proposals/Joan Clarkston
601 East 12th Street, Rm 1734
Kansas City, MO 64106

Telephone: 816-426-7469

Proposals may be sent to the above address via US Mail or other commercial carriers. All deliveries must be made no later than the due date and time stipulated in the solicitation in order to be considered.

To be considered a complete proposal, the application must include:

Technical Proposals: **Two (2) copies** of each of the following (totaling a maximum of 25 pages):

(a) Cover Page (front and back counted as one page, required form see Section 3.3.1 and 9.1)
(b) Project Summary (required form, see Section 3.3.3 and 9.2)
(c) Technical Content (up to 22 printed pages, see Section 3.3.4)
(d) Proposed Budget (required form, see Section 3.6 and 9.3)

Supplemental Budget and Other Information: **Two (2) copies** of each of the following (not counted towards the 25 page limit):

(a) Supplemental Budget documentation (required, see Section 9.4)
(b) SBIR Funding Agreement Certification (required form, see Section 9.5)
(c) Screen shot or similar copy of proposers' Company Registry as noted on SBIR.gov website (required, see Section 3.3.2)
(d) List of prior Phase II awards for proposers awarded more than 15 SBIR Phase II awards in the prior five fiscal years (required, if applicable, see Section 3.5)

Acknowledgment of receipt of a proposal by NOAA will be made. All correspondence relating to proposals must cite the specific **proposal number** identified in the acknowledgment.

(a) **Packaging: Secure packaging is mandatory. NOAA cannot process proposals damaged in transit. All copies of the proposal must be sent in the same package. Do not send separate "information copies," or several packages containing parts of a single proposal. The top copy must be signed as an original by the principal investigator and the corporate official. Other copies may be photocopies. Proposals without appropriate signatures may be rejected.**

(b) **Bindings: <u>Do not use special bindings or covers</u>**. Staple the pages in the upper left hand corner of each proposal. Separation or loss of proposal pages is not the responsibility of NOAA.

Proposals in response to this solicitation shall be valid for a period of 240 calendar days after the closing date of the solicitation.

6.3 Warning

While it is permissible, with proper notification to NOAA, to submit identical or essentially equivalent proposals for consideration under numerous Federal program solicitations, it is unlawful to enter into contracts requiring essentially equivalent effort. Offeror, if awarded, will be required at the time of the award and during the term of the award up to final payment to certify that essentially equivalent work is not being performed under funding agreements from any other federal agencies. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

7.0 SCIENTIFIC AND TECHNICAL INFORMATION SOURCES

7.1 General Information

The following web pages may be sources for additional technical information:

http://www.noaa.gov
http://techpartnerships.noaa.gov/
http://www.lib.noaa.gov

7.2 Oceanic and Atmospheric Science

- Scientific information in the areas of oceanic and atmospheric science may be obtained from organizations shown in the website: http://seagrant.noaa.gov/WhoWeAre/Leadership/SeaGrantDirectors.aspx

- National Shellfish Initiative Fact Sheet http://www.nmfs.noaa.gov/aquaculture/docs/policy/natl_shellfish_init_factsheet_summer_2013.pdf

- Overcoming Technical Barriers to the Sustainable Development of Competitive Marine Aquaculture in the United States (2008): http://www.nmfs.noaa.gov/aquaculture/docs/aquaculture_docs/noaanist_techbarriers_final.pdf

- NOAA Marine Aquaculture Policy (2011): http://www.nmfs.noaa.gov/aquaculture/docs/policy/noaa_aquaculture_policy_2011.pdf

- Department of Commerce Aquaculture Policy (2011): http://www.nmfs.noaa.gov/aquaculture/docs/policy/doc_aquaculture_policy_2011.pdf

- Rankin, S., et al. 2013a. A guide to constructing hydrophone arrays for passive acoustic data collection during NMFS shipboard cetacean surveys. NOAA-TM-NMFS-SWFSC-511, 33 p. https://swfsc.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-511.pdf

- Rankin, S., et al. 2013b. Building a Better Array: Developments in towed hydrophone arrays improve identification and localization of cetacean groups. DCLDE Workshop (p.80): http://soi.st-andrews.ac.uk/dclde2013/documents/DCLDE%20Book.pdf

- Southall, B., et al. 2012. Biological and Behavioral Reponse Studies of Marine Mammals in Southern California, 2011. Final Project Report. http://sea-inc.net/assets/pdf/Southalletal_MTSJ_SOCAL%20BRS%20methods.pdf.

- Paris, C., R. Cowen, R. Claro, and K. Lindeman. Larval transport pathways from Cuban Snapper spawning aggregations based on biophysical modeling, Marine Ecoloty Prog. Series, 296:93-106, 2005.

- Gawarkiewicz, G. S. Monismith, and J. Largier. Observing Larval Transport Processes Affecting Population Connectivity: Progress and Challenges 2007, Oceanography 20(3):40–53, http://dx.doi.org/10.5670/oceanog.2007.28.

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- Suranjana Saha and Coauthors, 2010: The NCEP Climate Forecast System Reanalysis, Bull. Amer. Meteor. Soc, 91,1015-1057.

- Suranjana Saha and Coauthors, 2014: The NCEP Climate Forecast System Version 2. J. Climate, 27, 2185–2208.

- S. N. Vecherin, V. E. Ostashev, D. K. Wilson, C. W. Fairall, and L. Bariteau, "Sonic anemometer as a small acoustic tomography array", *Boundary Layer Meteorology*, **149**, (2), 165-178 (2013). DOI: 10.1007/s10546-013-9843-9.

7.3 SBIR National Conferences

Federal R&D Opportunities
for
Technology Intensive Firms

Marketing Opportunities for R&D and Technology Projects with Federal Agencies and Major Corporations.

Techniques and Strategies for Commercializing R&D through Venture Capital, Joint Ventures, Partnering, Subcontracts, Licensing, and International Markets.

Management Seminars in Marketing and Business Planning.

Working with Academia and the States.

Agency and company exhibits and/or One-on-One tables will be open for networking opportunities for all attendees!

For further information on dates and times of upcoming conferences, see the SBIR Homepage: www.sbir.gov

8.0 RESEARCH TOPICS

8.1 TOPIC: Resilient Coastal Communities and Economies

8.1.1F SUBTOPIC: Improving Seed Production for Marine Shellfish Aquaculture in the United States

Summary: Shellfish represent the largest sector of marine aquaculture in the United States, accounting for approximately two thirds of marine aquaculture production. Domestic shellfish production provides a source of seafood for growing demand, creates coastal jobs and business opportunities, builds habitat for important commercial and recreation species, restores native populations, protects shorelines, and provides ecosystem services such as improvement of water quality. In recognizing the broad suite of economic, social and environmental benefits domestic shellfish production provides, NOAA established the National Shellfish Initiative in 2011 with the goal to increase populations of bivalve shellfish in our nation's coastal waters through sustainable commercial production and restoration activities. Hatcheries and controlled nursery systems are playing a greater role in commercial and restoration aquaculture. Shellfish hatcheries are at an early stage of development, with many opportunities for technological improvement. Shellfish seed production, hatching and larval survival are consistent bottlenecks for commercial shellfish production. Proposals are requested for research towards innovative products and services to improve shellfish seed production. Priority is given to research that addresses these key bottlenecks to boost domestic commercial shellfish production and in turn enhance ecosystem services, increase our sustainable seafood supply and create economic opportunities for coastal communities.

Project Goals: New technologies, products and methods are needed to improve commercial shellfish seed production. Projects that would support production improvements can include but are not limited to: technologies, methods or seed strains developed for disease prevention or resistance (vaccines, systems to minimize, eliminate and control pathogens, hatchery water treatment technologies), early disease detection (real-time monitoring systems), ocean acidification resistance, acclimation or mitigation, increased seed production (performance traits, live food quality, food deliver, tools to assess reproduction and maturation potential), improved reproduction (heritability and genetic correlation estimates, selective breeding) or larval survival. As ocean acidification continues to impact our domestic shellfish industry, new technologies or methods that address this increasingly prevalent issue are especially essential.

Phase I Activities and Expected Deliverables:
Activities:

- Identify key bottlenecks that will be addressed
- Execute research and development of techniques and management measures to address these bottlenecks

Deliverables:

- Proof of concept
- Report showing promise for commercial application of developed technology/technique

Phase II Activities and Expected Deliverables:
Activities:

- Prototype trials of the techniques and products developed in Phase I

Deliverables:

- Detailed report on developed technology/technique showing biological and economic feasibility under commercial conditions

References:
National Shellfish Initiative Fact Sheet
http://www.nmfs.noaa.gov/aquaculture/docs/policy/natl_shellfish_init_factsheet_summer_2013.pdf

Overcoming Technical Barriers to the Sustainable Development of Competitive Marine Aquaculture in the United States (2008)
http://www.nmfs.noaa.gov/aquaculture/docs/aquaculture_docs/noaanist_techbarriers_final.pdf

NOAA Marine Aquaculture Policy (2011)
http://www.nmfs.noaa.gov/aquaculture/docs/policy/noaa_aquaculture_policy_2011.pdf

Department of Commerce Aquaculture Policy (2011)
http://www.nmfs.noaa.gov/aquaculture/docs/policy/doc_aquaculture_policy_2011.pdf

8.1.2N SUBTOPIC: Low-Cost on the Beach Brevetoxin Field Analysis Kit

Summary: Provide coastal managers with a low-cost test kit that can be used for real-time toxicity testing at beaches vulnerable to harmful algal blooms (HABs). The availability of low-cost assays will enable rapid determination of HAB severity at multiple locations. This information will provide actionable data for coastal management in near real-time and will serve to improve forecasts.

Project Goals: Toxins in coastal waters are difficult to monitor. Current methods are slow and the delay can result in potential threats to human health and loss of economic activity. This is particularly true of the toxins produced by harmful algal blooms which are becoming more frequent and must be continuously measured at public beaches to ensure public safety. Two issues that must be overcome in field tests for toxins in seawater are the complexity of sample processing and the lack of rugged measurement devices. To overcome these limitations, we are seeking proposals for the development of rapid field test kit for brevetoxins in seawater analogous to the glucose meters commonly used by diabetics. Brevetoxins are potent neurotoxins produced by blooms of the microalga *Karenia brevis*. When these blooms reach the beach, cells are broken open in the surf zone releasing toxic aerosols which cause

respiratory distress. The consumption of shellfish contaminated with brevetoxins can induce neurotoxic shellfish poisoning.

Currently, when this happens in Florida, the standard protocol is to issue a generic warning is issued at a county to half-county level, despite the fact that many times only specific beaches are adversely affected. The result of the generic warning is that it leads to unnecessary economic losses when people avoid beach areas which are actually safe. To address these issues, NOAA is developing a comprehensive monitoring system which will allow brevetoxin testing of each potentially affected beach in Florida every day to protect human health and reduce economic losses. Consequently, there is a need for rapid, easy to use, rugged and inexpensive detection methodologies which allow toxins to be measured onsite.

The goal of this solicitation is to develop a low-cost, easy-to-use sampling system to enable a sustainable volunteer monitoring program (lifeguards, others) that tests daily for the presence of brevetoxin at every beach along the entire FL west coast.

Phase I Activities and Expected Deliverables:
Develop a plan to fabricate a portable, low-cost, easy-to-use detection system for detection of the algal toxins brevetoxin-2, -3 in seawater containing toxic *Karenia brevis* cells.

The test kit must provide:

- A rapid method for processing seawater samples containing toxic *K. brevis* cells prior to analysis.
- Ability to measure toxin in the seawater at levels found when 50,000 to 1,000,000 *K. brevis* cells are present in the water column. A toxic *K. brevis* cell contains on average 10 to 16 femtograms of brevetoxins-2, -3 per cell. The assay sensitivity will therefore depend on the amount of sample that has to be processed. The smaller the volume required for processing, the more feasible the assay will be for application in the field. It is estimated that the lower sensitivity will be in the 0.3 parts per billion range or lower.
- Demonstration that the assay signal is proportional to the number of cells extracted over the concentration range from 50,000 to 1,000,000 *K. brevis* cells per liter.
- Sample and analysis time of less than 15 minutes.
- A per-sample cost between $8 and $15.
- An internal control to assure quality assurance.
- Demonstration that the reagents used in the assay are stable for at least 3 months if stored properly. Note: the reagents will ultimately be used on the beach so a discussion of how the proposed reagents would need to be stored and handled to make the assay feasible and reliable in a high temperature, high humidity environment is a required element in the response to the RFP.
- Digital readout of the results preferable.
- An analyzer/output/reader device costing less than $500 per unit.

Phase II Activities and Expected Deliverables:
- Demonstrate the fabrication of a test-kit that will meet the Phase I requirements.

- Demonstrate accuracy and repeatability of the test-kits with at least 50 samples verified by independent analysis to meet the accuracy requirements in Phase I.
- Provide a commercialization plan to fabricate and deliver the test-kits on a cost-basis specified in the Phase I requirements.

8.2 TOPIC: Healthy Oceans

8.2.1F SUBTOPIC: Affordable Robust Nonlinear Towed Hydrophone Arrays

Summary: Passive acoustics has been increasingly used for population estimation during shipboard cetacean surveys conducted by NMFS Science Centers. Towed linear arrays are well-developed but are limited in their ability to provide real-time 3D localization. This is important for application to deep-diving species such as beaked whales, and for real-time localization of a single sound, which is important for line-transect surveys. Development of a volumetric (nonlinear) towed hydrophone array can provide improved localization and, when used in combination with existing modular linear arrays, can provide instantaneous localization to sound sources using a single sound. These improvements are valuable not only for NMFS population surveys, but for detection of cetaceans during mitigation efforts (seismic industries, Navy) and have the potential to aid in search and rescue efforts (beacon detection/localization).

Current development of volumetric towed hydrophones show great potential, but have been limited by increased flow noise, tension, and instability at high speeds (Rankin, 2013b, Southall, et al., 2012). NOAA Fisheries is requesting the development of nonlinear (volumetric) towed hydrophone array that can be used with current modular array systems developed by NMFS Science Centers (see Rankin et al. 2013a).

Project Goals: The goal of this project is to develop a functioning nonlinear array using affordable materials and a modular design that will provide accurate 3D localization of marine mammals in real-time. The modular design must be compatible with towed hydrophones developed by NMFS Science Centers (Rankin et al. 2013a). Extensive testing by NMFS has identified a pre-amplification system that works well with HTI 96min hydrophones and 12v power; deviation from this should be well tested and compatible with NMFS systems. The prototypes should be robust and stable when towed at 10 knots behind a research vessel. Materials must be compatible with underwater acoustic detection (acoustically transparent and either negatively or neutrally buoyant). The prototypes should consist of modular components such that repairs and replacement of individual components can be conducted by the users in field situations.

As many of the preliminary tests have already been conducted by NMFS Science Centers, we expect that development of an initial prototype can be conducted during Phase 1. We expect that Phase 2 will consist of repeated testing of modified prototypes until a stable and robust system is developed. During commercial development phase, individual components should be available for replacement.

Phase I Activities and Expected Deliverables:
Activities include:

- Identification of appropriate and cost-effective materials
- Hydrodynamic modeling of prototype(s)
- Development and initial testing of prototype(s)

Deliverables include:

- Detailed report of initial prototype and results from initial modeling and testing

Phase II Activities and Expected Deliverables:
Activities include:

- Field testing and Improvement of Prototype(s)
- Integrating prototype with currently available software (Pamguard)

Deliverables include:

- Fully functional pre-production prototype(s) with ancillary components necessary for further use on NMFS research vessels; and
- Detailed report documenting the project, prototype design and results from hydrodynamic modeling and field testing

References:
Rankin, S., et al. 2013a. A guide to constructing hydrophone arrays for passive acoustic data collection during NMFS shipboard cetacean surveys. NOAA-TM-NMFS-SWFSC-511, 33 p. https://swfsc.noaa.gov/publications/TM/SWFSC/NOAA-TM-NMFS-SWFSC-511.pdf

Rankin, S., et al. 2013b. Building a Better Array: Developments in towed hydrophone arrays improve identification and localization of cetacean groups. DCLDE Workshop (p.80): http://soi.st-andrews.ac.uk/dclde2013/documents/DCLDE%20Book.pdf

Southall, B., et al. 2012. Biological and Behavioral Reponse Studies of Marine Mammals in Southern California, 2011. Final Project Report. http://sea-inc.net/assets/pdf/Southalletal_MTSJ_SOCAL%20BRS%20methods.pdf

8.2.2R SUBTOPIC: New Observing Platform for Monitoring Fish Larval Trajectories

Summary: The Caribbean Sea, Gulf of Mexico, and Straits of Florida contain spawning areas for a number of ecologically and economically important reef, mesopelagic, and pelagic fish species. However, little is known regarding the transport and distribution of fish larvae throughout the area. Understanding the degree of biological connectivity between remote marine areas by means of ocean currents, versus local recruitment of larvae, often aided by ocean eddies, will require targeted observations using the development of new observational techniques. Observations from a platform able to monitor these trajectories and to assess larval transport are critical in biochemical models, to assess the link of the ocean and climate variability on ecosystems, and to improve current ecosystem numerical forecasts from seasonal to climate timescales. Existing observations for measuring larval trajectories currently rely on surface drifters, which are large buoys. The shape, size, and other characteristics of

the standard drifter do not resemble those of fish larvae. A new observational platform is needed to improve ecosystems assessments. Major issues to address will be: size of the platform, buoyancy changes to adapt for diurnal effects, measuring parameters such as temperature and salinity, determining their precise location, data recording and transmission, durability, cost-effectiveness, and expendability.

Project Goals: Ocean variability, climate change, extreme weather events, and distress in ecosystems are linked to complex environmental patterns and with larval transport and distribution. The goal is to design a new observational platform that can assess fish larvae trajectories and transports in order to properly associate them with changes in ocean dynamics, climate, and ecosystem parameters. The main focal areas of this work are: 1) hardware and 2) capabilities. Each of them presents a number of technical challenges. Successful projects will produce a platform with a desired size (<10cm in diameter), biodegradable construction materials, in a cost-effectiveness fashion (up to $300 per unit); with capabilities that include changes in buoyancy (vertical motion of up to 10m), battery life (of the order of months to years), real-time transmission, data recording system, and capability to observe a minimum suite of environmental parameters, such as location, pressure and depth, temperature, salinity, light intensity, with an error of less than 5%. The final platform will be a package that houses all sensors and suitable for ocean field deployments.

Phase I Activities and Expected Deliverables:
Activities for both focal areas:
- Identify and carry out review of sensors and materials that can be used to manufacture the desired platform.
- Develop and demonstrate capability to create a platform as described above that can be used to better approximate the trajectories of fish larvae by monitoring its trajectory, and capable of controlled vertical displacements..
- Quantify errors associated with the data generated including location and environmental parameters.

Deliverables for both focal areas:
- A detailed report documenting methods and results, errors and accuracy of sensors, with discussion of results and identification of success and remaining challenges, and cost analysis.
- Provide a conceptual design of the desired platform for monitoring larval transport and presentation of a design review, diagrams, prototype schematics, drawings, and prototype hardware mock-up.

Phase II Activities and Expected Deliverables:
Activities for both focal areas:
- Develop one or more prototypes of the platform to accomplish the desired capabilities developed during Phase I.
- Provide renderings and footprints of the prototype.
- Test prototypes in a controlled environment, where water circulation, light intensity, and environmental parameters are known in order to produce an assessment of the prototype performance and capabilities.
- Evaluate observational errors from the prototype together with accuracy of sensors.

Deliverables for both focal areas:

- Provide a detailed report of results of tests of the prototypes, including documentation of results, errors, accuracy of all measurements, identifying areas of success and of upcoming challenges, and cost analysis.

References:

Paris, C., R. Cowen, R. Claro, and K. Lindeman. Larval transport pathways from Cuban Snapper spawning aggregations based on biophysical modeling, Marine Ecoloty Prog. Series, 296:93-106, 2005.

Gawarkiewicz, G. S. Monismith, and J. Largier. Observing Larval Transport Processes Affecting Population Connectivity: Progress and Challenges 2007, *Oceanography* 20(3):40–53, http://dx.doi.org/10.5670/oceanog.2007.28.

Hare, J., J. Churchill, R. Cowen, T. Berger, P. Cornillon, P. Dragos, S. Glenn. J. Govoni, and T. Lee. Routes and rates of larval fish transport from the southeast to the northeast United States continental shelf., Limnol. Oceangr. 47: 1774-1789, 2002.

8.3 TOPIC: Climate Adaptation and Mitigation

8.3.1C SUBTOPIC: Probability Forecasts of Business Impact Variables from CFS2 Ensembles

Summary: Many climate-sensitive businesses and activities focus on variables that could be derived from the wide range of meteorological variables produced by the NWS Climate Forecast System v2 (CFS2). Examples include degree-days in energy and agriculture, potential wind and solar power in renewable energy, and wildfire risk in wildland management.

To serve such business users, the CFS2 ensemble probabilities for temperature, precipitation, and other variables must be converted into probabilities about business-impact variables on subseasonal timescales. This requires the development and validation of algorithms specific to each impact variable. The business impact probabilities should be presented in graphical and digital forms for further analysis and ingest into business decision support systems.

Forecasts of some weather-scale business impact variables are commercially available, but these methods cannot be extended readily to the subseasonal ranges because the model forecasts on these scales must be calibrated in order to produce reliable and skillful probabilities.

Project Goals: The goal of this project is to create a commercially viable system to deliver probabilistic forecasts of business impact variables on subseasonal timescales by suitable transformation of the ensemble forecasts of the CFSv2 and other similar forecast systems or multi-model ensembles. An important component of the goal is to demonstrate the skill and reliability of the forecasts through appropriate validation studies.

Phase I Activities and Expected Deliverables:
Activities

- Identify a suite of impact variables of primary interest to business and industry
- Select a small Phase I subset of variables that can be obtained easily from CFSv2 and can be used to develop prototype methods and demonstrate proof of concept
- Develop algorithms for computing probability forecasts of the Phase I subset from CFS2 ensembles
- Develop methods for validating the predicted variables of the Phase I subset
- Develop a browser-based system for displaying or delivering the probability forecasts of the Phase I variables

Deliverables

- A formal report describing or demonstrating
  - the suite of business impact variables and the Phase I subset
  - the algorithms for obtaining Phase I impact variables from model variables
  - the skill and reliability of a sample of forecasts of the Phase I subset variables.
- A functioning, prototype browser-based system for delivering probability forecasts of the Phase I variables on the subseasonal timescales

Phase II Activities and Expected Deliverables:
Activities

- Extend the Phase I methods to a broader suite of impact variables, including some of the most challenging possibilities
- Continue development of the browser-based forecast display and delivery system to a commercially viable prototype system

Deliverables

- Documentation of the algorithms used to create the probabilistic forecasts for the final suite of business impact variables
- Documentation of the skill and reliability of the probabilistic forecasts for the final suite of business impact variables
- A browser-based system for displaying and delivering probability forecasts of the final suite of business impact variables that is ready and suitable for initial commercial deployment

References:
Suranjana Saha and Coauthors, 2010: The NCEP Climate Forecast System Reanalysis, *Bull. Amer. Meteor. Soc, 91*,1015-1057.

Suranjana Saha and Coauthors, 2014: The NCEP Climate Forecast System Version 2. *J. Climate, 27*, 2185–2208.

8.3.2D SUBTOPIC: Coastal Zone Wide-Swath Airborne Topography, Surface Current and Debris Mapper

Summary: NOAA's goals and objectives include preparing, educating and informing society

as to the impacts of climate change and severe weather. Both affect coastal regions of United States but also interior regions especially near lakes and rivers. To help society meet the challenges climate change and severe weather, NOAA requires timely and cost effective means to:

1) Surface water and land topography mapping of ocean, coastal, water ways, fresh water regions;
2) Surface (fresh and ocean) current mapping;
3) Debris detection mapping in coastal regions, water ways and marine navigation routes; and
4) Storm surge mapping.

Today, LIDARs, synthetic aperture radars, Doppler radars and altimeters are used to provide surface topography and surface water current mapping. However, these technologies can be expensive to operate, provide limited coverage, may not always be deployable from aircraft or are limited to specific aircraft and flight altitudes. Debris and surface contamination detection is becoming more important as events such as the tsunami in Japan and Gulf oil spill occur. As the climate changes, coastal and inland flooding is on the rise and more timely and cost effective means are required to map the surface water and terrestrial topography in these regions to better assess and prepare for weather and flooding events. In events such as land falling hurricanes real-time monitoring before, during and after of coastal regions and water ways is necessary to more efficiently deploy limited resources and provide society with the necessary information to prepare and react to these events in order to minimize loss of life and impact on the economy.

NOAA seeks innovative sensor that can provide large swath measurements of the items listed above in a cost effective manner, deployable on multiple airborne platforms, manned and unmanned, up to 70 kft altitudes, and operational in large range of atmospheric conditions (e.g. cloud covered).

Project Goals: This project seeks an innovative solution that addresses coastal observational requirements currently requiring several different types of sensors operated from a variety of platforms. Knowledge of the coastal zone environment (topography, surface currents, debris in water ways, and impacts of storm surge) before, during and after significant weather events is critically important for both long term and short term planning and mitigation activities. A solution that addresses these observation requirements that can quickly and efficiently create maps over large swaths from an airborne platform (manned and unmanned) would be a great benefit to NOAA's mission objectives.

Phase I Activities and Expected Deliverables:
Activities:

- Define application/baseline requirements including operation/install requirements on targeted platforms.
- Develop and define sensor concept and system specifications.
- Develop preliminary system design to meets above requirements and specifications.

- Determine measurement performance in terms of final geophysical parameters, spatial coverage and temporal coverage.
- Determine feasibility and cost to build prototype and estimate operational costs of a Phase 3 system.
- Performance commercial application study identifying market space and potential revenue from the product (maybe sensor and/or data) developed based on the system developed through the SBIR.

Deliverables:

- Requirements Definitions.
- Sensor Concept and Preliminary System Design.
- Performance, Feasibility, Cost Analysis.
- Commercial Application Analysis.
- Final Report.

Phase II Activities and Expected Deliverables:

Activities:

- Develop detailed system design for Phase II prototype system.
- Perform full system performance analysis and determined compliance with requirements and specifications from Phase I.
- Develop test / verification plan for evaluating Phase II prototype performance.
- Fabricate Phase II prototype system.
- Execute performance / verification testing.
- Identify commercial products and market space being addressed by the technology developed through this effort.

Deliverables:

- Performance Analysis Report.
- Test/Verification Plan
- Performance Testing Report
- Phase II Prototype System.
- Commercial / Market Analysis Report.
- Final Report.

8.4 TOPIC: Weather-Ready Nation

8.4.1W SUBTOPIC: Monitoring Active Region Development on the Far-Side of the Sun

Summary: Space weather impacts a growing number of technologies that our society depends on. The need for space weather forecasts arose in the 1940s when the first radio communications were established. The Department of Defense relies on many technologies, such as early warning radars and satellite navigation,that are susceptible to space weather. The list of civil activities that are impacted include, electric power, commercial airlines, oil exploration, satellites, space exploration, agriculture, surveying and road building, just to name a few. Forecasting space weather has become a critical activity for NOAA, the US Air Force,

and a number of space weather forecast offices around the world. With the increased need for space weather information there has grown a network of commercial service providers who provide specific and tailored space weather forecast services to both industry and government. Any or all of the entities would be interested in new techniques for forecasting space weather.

Most major space weather events originate from the Sun. Seen from Earth, the sun rotates once every 27 days. Solar active regions grow and recede as they rotate around the sun. Knowing how an active region develops while it is on the far-side of the Sun (not visible from Earth) helps forecasters predict what will happen when that active region rotates back to the Earth-directed side of the Sun. Techniques to better understand the development of solar activity on the far side of the sun improve the 5-10 day forecasts of space weather storms.

Project Goals: There are several newly developed techniques that allow us to monitor developments on the far-side of the sun. These include helioselismology (solar surface motions that originate from major eruptions) and observing the faint light scattered off the solar atmosphere beyond the sun. The recent NASA STEREO mission has flown satellites to observe the far-side of the Sun but these satellites will move beyond the ideal locations and become much less useful for far-side imaging. Instead, they have provided data that helps to develop and validate new techniques. They also proved how important knowledge of the far-side of the Sun can be to space weather forecasting.

Phase I Activities and Expected Deliverables:

- Assess the needs of the potential customers and users of this product.
- Evaluate several different techniques for monitoring active region growth or decay on the far-side of the Sun.
    - o Test for accuracy and consistency.
    - o Determine the long-term reliability of the data required for making the assessments.
- Select one or more techniques for further development.
- Develop algorithms and test and evaluate them against the available far-side image data.
- Quantify the results showing the uncertainties and errors in both growth/decay rates and position.
- Deliver a report and documentation on how to monitor solar activity on the farside of the Sun. Provide prototype code.

Phase II Activities and Expected Deliverables:

- Develop a real-time prototype of the product for test and evaluation
- Establish links to realtime data
- Develop code that could be made operational
- Document code for possible transition to operations
- Run the test code in realtime and evaluate the performance.
- Develop products based on customer needs and requirements

8.4.2R SUBTOPIC: Ultrasonic Anemometers/Thermometers with Increased Spatial Resolution

Summary: Ultrasonic anemometers/thermometers are commercially produced, robust instruments for measurements of temperature and velocity. Much of a progress in the boundary layer meteorology over the last few decades can be attributed to the wide use of these instruments. Due to concerns about wind distortion, the transducers of an ultrasonic anemometer are located at some distance from each other. As a result, the anemometer enables only path-averaged measurements of temperature and velocity, with a spatial resolution larger than about 15 cm. There are, however, several important applications/concerns in the boundary layer meteorology and theories of turbulence which require analysis of turbulent fields at smaller scales. Among these are: (i) studies of the inertial subrange at small scales which are important for analysis of the dissipation rate and the turbulent kinetic energy budget, (ii) studies of turbulence closure models, (iii) studies of energy transfer in the atmospheric boundary layer which are important, for example, for wind energy, (iv) measurements of turbulence, particularly momentum and heat fluxes, when the energy-containing range extends to spatial scales smaller than those resolved by currently used ultrasonic anemometers, e.g., near the surface or within canopies, (v) studies of small scale turbulence for the Ameriflux CO2 flux network. In principle, hot-wire and cold-wire anemometers enable one to make measurements of small-scale turbulence. However, these anemometers are not reliable instruments and often break down. Furthermore, they might disturb the flow around them. Therefore, there is a need for a new generation of ultrasonic anemometers/thermometers with increased spatial resolution.

Project Goals: The main goals of the project are to develop a concept and a prototype of a new generation of ultrasonic anemometers/thermometers with increased spatial resolution, with a final goal to produce them commercially. Different approaches for achieving these goals can be considered including but not limited to acoustic tomography. A new generation of ultrasonic anemometers should be reliable, robust instruments designed to work in harsh conditions ranging from tropical marine environments to Polar Regions. The spatial resolution of such instruments should be increased to about 1-2 cm, with a potential to resolve even smaller scales.

Phase I Activities and Expected Deliverables:

- Develop a concept of an ultrasonic anemometer/thermometer with increased spatial resolution.
- Build a preliminary prototype of a new ultrasonic anemometer.
- Determine a feasibility of a new generation of reliable ultrasonic anemometers with increased spatial resolution.

Phase II Activities and Expected Deliverables:

- Design a commercial prototype of a new generation of robust ultrasonic anemometers/thermometers with increased spatial resolution.
- Build and test a commercial prototype of such ultrasonic anemometers.
- Develop a plan to commercialize a new generation of ultrasonic anemometers.

References:
S. N. Vecherin, V. E. Ostashev, D. K. Wilson, C. W. Fairall, and L. Bariteau, "Sonic anemometer as a small acoustic tomography array", *Boundary Layer Meteorology*, **149**, (2) , 165-178 (2013). DOI: 10.1007/s10546-013-9843-9.

8.4.3D SUBTOPIC: Accurate Nightlight for Satellite Calibration for Weather and Climate Applications

Summary: The excellent on-orbit performance of the Suomi NPP VIIRS Day Night Band (DNB) ushers in a new era of low light imaging at night. Its extreme sensitivity to low lights has already been demonstrated in numerous emerging applications, e.g., the rescue of a Bering Sea Fleet crab fishing vessel trapped in ice in the winter of 2013 in Alaska. This unprecedented capability heavily depends on its onboard calibration, which unfortunately has one significant limitation: it relies on solar signal which is more than seven orders of magnitudes brighter than the faint lights from fishing vessels. As a result, the absolute calibration accuracy for the low night light is no better than 15%. Also, the stability of the calibration for low light over time cannot yet be verified. A significant calibration issue may diminish the ability in distinguishing fishing vessels from noise. Furthermore, since the fishing light is typically a point source, both radiometric and spatial response of the DNB must be evaluated together, which is not possible with traditional methods. This leads to the unmet needs for accurate (3× better) active light sources at night to validate and monitor the DNB responses to maintain its performance. This will allow us to continue assisting in search and rescue of manmade faint light objects under severe weather conditions such as Hurricanes and Ice storms, helping the society to prepare for and respond to weather related events. It will also allow us to monitor the light intensity of human settlements and their energy use, and many other natural low light phenomena over time, to study climate change and its anthropogenic contributions

Project Goals: The goals of this project are to develop and deploy accurate active light sources (AALS) to selected calibration sites for the calibration/validation of the VIIRS DNB low light performance. The long term stability of the AALS, after characterizing and correcting any systematic drift, should be maintained at 1%, and the absolute accuracy of the light sources should be better than 5%. The AALS will only be turned on during the VIIRS DNB overpass at night around 1:30am local time. The light intensity should be higher than 3×10^{-9} W/cm^2·sr in order to be useful for DNB calibration. These light sources will be used as benchmarks for comparisons with objects of interest on the DNB imagery. Once the methodology is demonstrated at one site, it can be expanded to many other sites, potentially internationally.

Phase I Activities and Expected Deliverables:

- Study the feasibility of using SI traceable active night light source for the calibration/validation of VIIRS DNB for low light conditions at the top of the atmosphere in clear sky conditions with radiances between 3×10^{-9} to 1×10^{-8} W/cm^2·sr
- Perform trade studies with different approaches, such as direct illumination versus reflected target; choices of light sources

- Predict the long-term stability and absolute accuracy given the best and worst case scenarios
- Analyze the error budgets both at the light source and top of the atmosphere
- Evaluate alternative methodologies that may complement the active light source
- Develop concept of operations for accurate active light sources that can be deployed to selected sites to be detected by VIIRS DNB within ±10 degree scan angles; the absolute accuracy of the light source in radiances should be better than 5% in clear sky conditions

Phase II Activities and Expected Deliverables:

- Design and develop prototype units and calibrate them in the laboratory
- Deploy the unit to selected site for demonstration
- Demonstrate the viability of long term operations of the AALS for selected sites
- Select at least 3 sites for the AALS deployment and study the site suitability and variations in error budgets
- Study the stability of the light source at each site (expected to be better than 1% per year)
- Deploy the AALS to the 3 sites and demonstrate their operations
- Conduct market research on the commercialization of the AALS

8.5 TOPIC: Stakeholder Engagement

8.5.1X SUBTOPIC: Innovative Public Communication Technologies And Decision Support Tools

Summary: Effective and reciprocal engagement with stakeholders and communication of its science and services to the public are key elements of NOAA's Engagement Enterprise. There is a clearly stated need for developing and using newer technologies and approaches for better and more timely delivery of information and knowledge to the users. Also, stakeholder response and engagement are essential for NOAA to develop its programs and priorities as a service agency.

Many of the challenges that NOAA helps address do not stem from a lack of information, but from an uneven distribution of information. The best way for NOAA to meet the needs of its stakeholders is often to better deliver data and knowledge to those who have not yet accessed it.

NOAA is requesting proposals that provide innovative technologies for communicating NOAA's science and data products with the public. Examples of appropriate topics for research and technology development applications from small businesses include, but are not limited to the following:

- Design of new and innovative decision support tools for government and emergency responders that incorporate and deliver NOAA data in real-time to the public in an easily accessible and understandable format such as:

- Cell phone or tablet applications
- Websites or stand-alone computer programs
- Innovative user-interfaces for displaying complex geospatial data in ways that are easily understandable to the non-scientist

- Development of applications or technologies that engage stakeholder groups at the community level to improve NOAA's capacity to efficiently inform decision-making

- Creation of technologies that improve the use and understanding of NOAA's scientific information, products, and services within the educational community

- Development of innovative communication technologies that improve public comprehension and use of NOAA's scientific information, products, and services

- Creation of applications that integrate local and cultural knowledge to support effective communication of NOAA's scientific information, products, and services

Phase I Deliverables:

- Detailed proof of concept report describing the results of the research / technology development completed in Phase I
- Description of where the principal investigator expects the project to be at the end of Phase II including a description of how this research / technology will be commercialized

Phase II Deliverables:

- A prototype system that has been used to demonstrate the success of the research / technology development
- A detailed report on the demonstration of the prototype system including the results of the demonstration
- A thorough plan that describes approaches for transitioning this prototype system into the commercial marketplace

8.6 TOPIC: Data and Observations

8.6.1X SUBTOPIC: Sensors for Environmental Observations and Measurements

Summary: NOAA aims to improve the accuracy of observational data to meet the needs of all users by leveraging advanced technologies, following best practices, and fostering the use of national/international standards and traceability. This objective entails creating prototype sensors and methodologies that provide new technologies for detection, increased

measurement accuracy, and improved effectiveness/efficiency in field observations and monitoring.

NOAA is requesting proposals for highly innovative environmental sensors, systems of sensors, or sensing platforms for observing and transmitting physical, chemical, and biological parameters in the ocean and coastal zones, land surface, and cryosphere, as well as at all levels of the atmosphere. Once developed, sensors and platforms should be rugged, low-cost, reliable, and easy to deploy. Examples include:

- Instrumentation for highly-accurate measurements of ocean acidification in surface and sub-surface locations
- Instrumentation and methodologies for exploiting LIDAR and acoustics to measure ocean parameters
- Systems for identifying fish, characterizing by species, and providing accurate in-situ counts
- Tools for measuring/observing critical weather and climate parameters at various temporal and spatial scales
- Sensors and detection probes for coastal water quality parameters, including harmful algal bloom (HAB) cells and toxins, and for rapid assessment of microbial contamination and spoilage of seafood.

Phase I Activities and Expected Deliverables:

- Detailed proof of concept report describing the results of the research / technology development completed in Phase I
- Description of where the principal investigator expects the project to be at the end of Phase II including a description of how this research / technology will be commercialized

Phase II Activities and Expected Deliverables:

- A prototype system that has been used to demonstrate the success of the research / technology development
- A detailed report on the demonstration of the prototype system including the results of the demonstration
- A thorough plan that describes approaches for transitioning this prototype system into the commercial marketplace

9.0 SUBMISSION FORMS AND CERTIFICATIONS

9.1 NOAA Small Business Innovation Research (SBIR) Phase I Cover Page

Solicitation No.: NOAA-2015-1 Closing Date: January 14, 2015

Name of Submitting Firm:

Address of Firm (including Zip Code +4):

Title of Proposed Project:

Requested Amount: Proposed Duration: Solicitation Subtopic No.:

Solicitation Subtopic Title:

THE ABOVE ORGANIZATION CERTIFIES THAT:

1. It is a small business firm as defined in this Solicitation. Yes ☐ No ☐
2. The primary employment of the principal investigator will be with the firm at the time of award and during the conduct of the research. Yes ☐ No ☐
3. A minimum of two-thirds of research will be performed by this firm in Phase I. Yes ☐ No ☐
4. It qualifies as a minority and disadvantaged small business as defined in this Solicitation. Yes ☐ No ☐
5. It qualifies as a woman-owned small business as defined in this Solicitation. Yes ☐ No ☐
6. It will permit the government to disclose contact information of the corporate official of your concern, if your proposal does not result in an award, to appropriate local and State-level economic development organizations that may be interested in contacting you for further information. Yes ☐ No ☐
7. It authorizes contact information and project title to be provided to the NIST Manufacturing Extension Partnership (MEP) Program after awards have been announced. Yes ☐ No ☐
8. This firm and/or Principal Investigator ☐ has ☐ has not submitted proposals for essentially equivalent work under other federal program solicitations, or ☐ has ☐ has not received other federal awards for essentially equivalent work.
9. The offeror and/or any of its principals ☐ are ☐ are not presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency; and ☐ have ☐ have not within a three-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a Federal, state or local government contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, or receiving stolen property; and ☐ are ☐ are not presently indicted for, or otherwise criminally or civilly charged by a Government entity with, commission of any of these offenses.
10. It is a veteran-owned small business concern. Yes ☐ No ☐

    It is a service-disabled veteran-owned small business concern. Yes ☐ No ☐
11. It is a HUBZone small business concern listed, on the date of this representation, on the List of Qualified HUBZone Small Business Concerns maintained by the Small Business Administration, and no material change in ownership and control, principal office of ownership or HUBZone employee percentage has occurred since it was certified by the Small Business Administration in accordance with 13 CFR Part 126; and Yes ☐ No ☐

It is a joint venture that complies with the requirements of 13 CFR Part 126, and the representation above is accurate for the HUBZone small business concern, or concerns that are participating in the joint venture. [The offeror shall enter the name or names of the HUBZone small business concern or concerns that are participating in the joint venture]: Yes ☐ No ☐

Each HUBZone small business concern participating in the joint venture shall submit a separate signed copy of the HUBZone representation.

12. The company was not involved in the selection of any topic or subtopic. The company shall not participate in the review of the proposals. Yes ☐ No ☐

13. The company is registered in SAM.gov and the Representations and Certifications are completed. The NAICS code 541712 is included in the registration. Yes ☐ No ☐

PRINCIPAL INVESTIGATOR

Name:	Title:	Day Telephone No.:
Signature & Date:	Email:	Fax No.:

CORPORATE OFFICIAL (BUSINESS)

Name:	Title:	Day Telephone No.:
Signature & Date:	Email:	Fax No.:

OTHER INFORMATION

Year Firm Founded ☐ Number of Employees: Avg. Previous 12 mos. ☐ Currently ☐

Has a proposal for essentially equivalent work been submitted to another agency? Yes ☐ No ☐

If yes, what Agency?

Is your company registered in SAM? ☐ Yes ☐ No

Taxpayer Identification Number:

Data Universal Numbering System (DUNS) Number:

PROPRIETARY NOTICE

These data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part for any purpose other than evaluation of this proposal. If a funding agreement is awarded to this applicant as a result of or in connection with the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement and pursuant to applicable law. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained on pages _____ of this proposal.

1B

9.2 NOAA SBIR Project Summary Form

NAME OF FIRM:

AMOUNT REQUESTED:

ADDRESS:

PHONE #:

FAX #:

E-MAIL:

PRINCIPAL INVESTIGATOR (NAME AND TITLE):

TITLE OF PROJECT:

SOLICITATION SUBTOPIC NUMBER:

SOLICITATION SUBTOPIC TITLE:

TECHNICAL ABSTRACT (LIMIT 200 WORDS):

SUMMARY OF ANTICIPATED RESULTS:

9.3 NOAA SBIR Proposed Budget

COMPANY NAME					
A. PERSONNEL (*Employees)* NAME	ROLE IN PROJECT	EST. HOURS	HOURLY RATE	FRINGE BENEFITS [_____%]	TOTAL COST
	Principal Investigator /Project Manager				
B. EQUIPMENT (*specify type, whether purchased or leased, and cost)*					$_____
C. TRAVEL					$_____
D. OTHER DIRECT COSTS					$_____
1. Materials and Supplies			$_____		
2. Testing Services			$_____		
3. Computer Services			$_____		
4. Research Institution			$_____		
5. Subcontracts (including Consultants)			$_____		
6. Other			$_____		
TOTAL OTHER DIRECT COSTS					$_____
E. TOTAL DIRECT COSTS *(A through E)*					$_____
F. INDIRECT COSTS *(specify rate(s), as applicable)*					
TOTAL INDIRECT COSTS					$_____
G. TOTAL COSTS *(F plus G)*					$_____
H. FEE OR PROFIT RATE [_____%]					$_____
I. TOTAL AMOUNT OF THIS REQUEST *(H plus I)*					$_____
J. Has any executive agency of the United States Government performed any review of your accounts or records in connection with any other grant or contract within the past year? [ ]Yes [ ]No If Yes, give name, address, and phone number of reviewing office and official:					
K. CORPORATE/BUSINESS AUTHORIZED REPRESENTATIVE – TYPED NAME AND SIGNATURE AND DATE					
If additional space is needed, please provide the information in the Supplemental Budget Information.					

9.4 NOAA SBIR Budget Instructions

In accordance with Section 3.7 of the solicitation, the offeror is to submit a cost estimate with detailed information for each element, consistent with the offeror's cost accounting system.

NOAA SBIR Proposed Budget

Complete the "NOAA SBIR Proposed Budget" (See Section 9.3) for the Phase I effort and include it as the last page of the technical proposal. Verify the total request is accurate and does **not exceed $95,000**. The Proposed Summary Budget must be signed by the Corporate Official. Some items of the form under Section 9.3 may not apply to every proposal. Additionally, some firms may have different accounting practices for their overhead rates. Offerors should use indirect rates consistent with their own accounting system, even if different from the rate categories shown on the form. These differences should be discussed in the Supplemental Budget Documentation. Enough information should be provided on the Proposed Budget to allow NOAA to understand how the offeror plans to use the requested funds if award is considered. A complete cost breakdown should be provided giving direct costs, indirect costs, other direct costs, overheads, G&A, and profit. The offeror is to submit a cost estimate with detailed information consistent with the offeror's cost accounting system. A reasonable profit will be allowed.

As a reminder in completing the Proposal Budget Summary for Phase I, a minimum of two-thirds of the research and/or analytical effort must be performed by the proposing small business concern. The total cost for all consultant fees, facility leases, usage fees, and other subcontracts may not exceed one-third of the contract price. For Phase II, a minimum of one-half of the research and/or analytical effort must be performed by the proposing small business concern. The total cost for all consultant fees, facility leases, usage fees, and other subcontract or purchase agreements may not exceed one-half of the contract price.

Supplemental Budget Documentation

Offerors shall provide additional supplemental budget documentation for the Proposed Budget for the Government's Cost and Pricing Review. ***This Supplemental Budget Documentation shall NOT be utilized for evaluation of the Technical Proposal. Offerors must ensure that all relevant technical information is included within the 25 page technical proposal.*** The Supplemental Budget Documentation does **NOT** count towards the 25 page count requirement. Additionally, the government **only requires two (2) hard copies** of the Supplemental Budget Documentation. The Supplemental Budget Documentation shall include a coversheet and be organized, stapled, and easy to understand. The information should only supplement and help to justify and explain the amounts requested on the Proposed Budget sheet. Additionally, the documentation should indicate any known or anticipated source, quantity, unit price, competition obtained, and basis used to establish source and reasonable costs (e.g. other direct costs, equipment, and travel, etc.). If additional room is required, and not available on the SBIR Proposed Budget Form, it may be incorporated into the Supplemental Budget Documentation. The Proposed Budget Form should annotate the location of this information appropriately.

Instructions for Proposed Budget Summary Form:

Lines A Direct Labor. List the key personnel by name and role/function in the project. Other direct personnel need not specifically named, but their role, such as “technician,” total hours and hourly rate should be entered. Personnel whose costs are indirect (e.g. administrative personnel) should be included in Line F. Fringe benefits can be listed for each employee in the space provided, or they may be included within the indirect costs in Line F. Provide the Fringe Benefit percentage rate, if applicable to the firm’s accounting practices. In the Supplemental Budget Documentation, information shall be provided regarding the development of the Fringe Overhead rate or Other Indirect Rates, as applicable.
As a reminder, the PI/PM must be employed by the small business concern at the time of contract award and during the period of performance of the research effort. Additionally, at least 51% of the PI/PM's time must be spent with the awardee during the contract performance.

Line B, Equipment. List items costing over $5,000 and exceeding one year of useful life. Lesser items may be shown in Line D. Indicate in the Supplemental Budget Documentation whether equipment is to be purchased or leased along with supporting documentation on where it will be be purchased or leased. List each individual item with the corresponding cost. Include a copy of the quote or catalog price with the Supplemental Budget Documentation. Discuss any competition utilized, basis of source, and reasonableness of price. The inclusion of equipment will be carefully reviewed relative to need and appropriateness for the research proposed.

Line C, Travel. Include the overall requested Travel Amount on the 9.3 Budget Form. In the Supporting Documentation, the offeror shall itemize by destination, purpose, personnel, period, and cost for both staff and consultants. Budget breakdowns for travel funds must be justified and related to the needs of the project. Inclusion of travel expenses will be carefully reviewed relative to need and appropriateness for the research proposed. Foreign travel is not an appropriate expense. Typically travel for a technical kick-off meeting or to present a final report is not required.

Line D, Other Direct Costs. The overall materials and supplies, testing and/or computer services, and subcontracts (including consultants), and any other direct costs required for the project must be identified on the 9.3 Budget Form. In the Supplemental Budget Documentation, it shall specify type, quantity and unit cost (if applicable), and total estimated cost of these other direct costs. Incorporate a quote/proposal or catalog price for any other direct costs listed. The proposal should identify direct (e.g. labor categories, hours, & rates), indirect, other direct costs (e.g. materials, travel, etc.), and profit, as applicable. Discuss any competition utilized, basis of source, and reasonableness of price.

Line E, Total Direct Costs. Enter the sum of Lines A through E.

Line F, Indirect Costs. Cite your established Overhead (OH) and General and Administrative (G&A) rate, as appropriate. If you utilize different or additional overhead rates in accordance with your accounting practices, incorporate this information in this section with appropriate rate

information. In the Supplemental Budget Documentation, include information on the development of your indirect cost and their pools. A discussion of Indirect Costs and samples can be obtained at www.dcaa.mil/chap6.pdf or http://oamp.od.nih.gov/dfas/idc3tierexample.xls. If you have a negotiated Indirect Cost Rate with another federal agency, include a copy of this documentation with your Supplemental Budget Documentation.

Line G, Total Costs. Enter the total amount of the proposed project, the sum of Lines E and F.

Line H, Profit. The small business concern may request a reasonable profit. Include the rate proposed.

Line I, Total Amount of this request. Enter the sum of Lines G and H. This amount must equal the amount entered in the Cover Sheet Form. It cannot exceed $95,000.00.

Line J, Review of Accounts. Answer yes or no. If yes, enter name, address, and phone number of reviewing office and official. Additional details can be provided with the Supplemental Budget Information, as needed.

Line K, Corporate/Business Authorized Representative. A date with signature of someone with the authority to commit the company must be given.

9.5 SBIR Funding Agreement Certification

All small businesses must complete this certification with their proposal submission and any other time set forth in the funding agreement that is prior to performance of work under this award. This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to determine whether the business is eligible for a Small Business Innovation Research (SBIR) Program award. A similar certification will be used to ensure continued compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, SBA regulations (13 C.F.R. part 121), the SBIR Policy Directive and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business may not meet certain eligibility requirements at the time of award, they are required to file a size protest with the U.S. Small Business Administration (SBA), who will determine eligibility. At that time, SBA will request further clarification and supporting documentation in order to assist in the verification of any of the information provided as part of a protest. If the funding agreement officer believes, after award, that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided.

Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil, or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that (all boxes must be checked):

(1) The business concern meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

[_] Yes [_] No

(2) If a corporation, all corporate documents (articles of incorporation and any amendments, articles of conversion, by-laws and amendments, shareholder meeting minutes showing director elections, shareholder meeting minutes showing officer elections, organizational meeting minutes, all issued stock certificates, stock ledger, buy-sell agreements, stock transfer agreements, voting agreements, and documents relating to stock options, including the right to convert non-voting stock or debentures into voting stock) evidence that it meets the ownership and control requirements set forth in 13 C.F.R. § 121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(3) If a partnership, the partnership agreement evidences that it meets the ownership and control requirements set forth in 13 C.F.R. §121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(4) If a limited liability company, the articles of organization and any amendments, and operating agreement and amendments, evidence that it meets the ownership and control requirements set forth in 13 C.F.R §121.702.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(5) The birth certificates, naturalization papers, or passports show that any individuals it relies upon to meet the eligibility requirements are U.S. citizens or permanent resident aliens in the United States.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(6) It has no more than 500 employees, including the employees of its affiliates.

[_] Yes [_] No

(7) SBA has not issued a size determination currently in effect finding that this business concern exceeds the 500 employee size standard.

[_] Yes [_] No

(8) During the performance of the award, the principal investigator will spend more than one half of his/her time as an employee of the awardee or has requested and received a written deviation from this requirement from the funding agreement officer.

[_] Yes [_] No [_] Deviation approved in writing by funding agreement officer: _____%

(9) All, essentially equivalent work, or a portion of the work proposed under this project (check the applicable line):

[_] Has not been submitted for funding by another Federal agency.
[_] Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
[_] A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.

(10) During the performance of award, it will perform the applicable percentage of work unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research
[ ] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%

(11) During performance of award, the research/research and development will be performed in the United States unless a deviation is approved in writing by the funding agreement officer.

[_] Yes [_] No [_] Waiver has been granted

(12) During performance of award, the research/research and development will be performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.

[_] Yes [_] No

(13) It has registered itself on SBA's database as majority-owned by venture capital operating companies, hedge funds, or private equity firms.

[_] Yes [_] No [_] N/A

Explain why N/A: _____

_____

(14) It is a Covered Small Business Concern [a small business concern that: (a) was not majority-owned by multiple venture capital operating companies (VCOCs), hedge funds, or private equity firms on the date on which it submitted an application in response to an SBIR solicitation; and (b) on the date of the SBIR award, which is made more than 9 months after the closing date of the solicitation, is majority-owned by multiple venture capital operating companies, hedge funds, or private equity firms].

[_] Yes [_] No

[_] It will notify the Federal agency immediately if all or a portion of the work authorized and funded under this award is subsequently funded by another Federal agency.

[_] I understand that the information submitted may be given to Federal, State, and local agencies for determining violations of law and other purposes.

[_] I am an officer of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern that the information provided in this certification, the application, and all other information submitted in connection with this application, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 et seq.); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 et seq.); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and nonprocurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

_____ _____
Signature Date

_____
Print Name (First, Middle, Last)

_____
Title

_____
Business Name

9.6 SBIR Funding Agreement Certification – Life Cycle Certification

All SBIR Phase I and Phase II awardees must complete this certification at all times set forth in the funding agreement (see §8(h) of the SBIR Policy Directive). This includes checking all of the boxes and having an authorized officer of the awardee sign and date the certification each time it is requested.

Please read carefully the following certification statements. The Federal government relies on the information to ensure compliance with specific program requirements during the life of the funding agreement. The definitions for the terms used in this certification are set forth in the Small Business Act, the SBIR Policy Directive, and also any statutory and regulatory provisions referenced in those authorities.

If the funding agreement officer believes that the business is not meeting certain funding agreement requirements, the agency may request further clarification and supporting documentation in order to assist in the verification of any of the information provided.

Even if correct information has been included in other materials submitted to the Federal government, any action taken with respect to this certification does not affect the Government's right to pursue criminal, civil, or administrative remedies for incorrect or incomplete information given in the certification. Each person signing this certification may be prosecuted if they have provided false information.

The undersigned has reviewed, verified and certifies that (<u>all boxes must be checked</u>):

(1) The principal investigator spent more than one half of his/her time as an employee of the awardee or the awardee has requested and received a written deviation from this requirement from the funding agreement officer.

[_] Yes [_] No [_] Deviation approved in writing by funding agreement officer: _____%

(2) All, essentially equivalent work, or a portion of the work performed under this project (check the applicable line):

[_] Has not been submitted for funding by another Federal agency.
[_] Has been submitted for funding by another Federal agency but has not been funded under any other Federal grant, contract, subcontract or other transaction.
[_] A portion has been funded by another grant, contract, or subcontract as described in detail in the proposal and approved in writing by the funding agreement officer.

(3) Upon completion of the award it will have performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research

[_] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%

(4) The work is completed and it has performed the applicable percentage of work, unless a deviation from this requirement is approved in writing by the funding agreement officer (check the applicable line and fill in if needed):

[_] SBIR Phase I: at least two-thirds (66 2/3%) of the research
[_] SBIR Phase II: at least half (50%) of the research
[_] Deviation approved in writing by the funding agreement officer: _____%
[_] N/A because work is not completed

(5) The research/research and development is performed in the United States unless a deviation is approved in writing by the funding agreement officer.

[_] Yes [_] No [_] Waiver has been granted

(6) The research/research and development is performed at my facilities with my employees, except as otherwise indicated in the SBIR application and approved in the funding agreement.

[_] Yes [_] No

[_] It will notify the Federal agency immediately if all or a portion of the work authorized and funded under this award is subsequently funded by another Federal agency.

[_] I understand that the information submitted may be given to Federal, State, and local agencies for determining violations of law and other purposes.

[_] I am an officer of the business concern authorized to represent it and sign this certification on its behalf. By signing this certification, I am representing on my own behalf, and on behalf of the business concern that the information provided in this certification, the application, and all other information submitted in connection with the award, is true and correct as of the date of submission. I acknowledge that any intentional or negligent misrepresentation of the information contained in this certification may result in criminal, civil or administrative sanctions, including but not limited to: (1) fines, restitution and/or imprisonment under 18 U.S.C. §1001; (2) treble damages and civil penalties under the False Claims Act (31 U.S.C. §3729 et seq.); (3) double damages and civil penalties under the Program Fraud Civil Remedies Act (31 U.S.C. §3801 et seq.); (4) civil recovery of award funds, (5) suspension and/or debarment from all Federal procurement and nonprocurement transactions (FAR Subpart 9.4 or 2 C.F.R. part 180); and (6) other administrative penalties including termination of SBIR/STTR awards.

_____ _____

Signature Date

_____

Print Name (First, Middle, Last)

_____

Title

_____

Business Name

9.7 NOAA/SBIR CHECKLIST

Please review this checklist carefully to assure that your proposal meets the NOAA requirements. Failure to meet these requirements may result in your proposal being rejected without consideration.

Two (2) copies of the proposals (Technical and Supplemental Budget and Other Information) must be received by 4:00 p.m. (CST) January 14, 2015.

_____ 1. The **COVER PAGE** (Form 9.1) has been completed and is page 1 of the proposal (front and back). Required signatures are included (see Section 3.3.1)

_____ 2. The **PROJECT SUMMARY** (Form 9.2) has been completed and is page 2 of the proposal. The abstract contains no proprietary information (see Section 3.3.3).

_____ 3. The **TECHICAL CONTENT** of the proposal begins on **PAGE 3** and includes the items identified in **SECTION 3.3.4** of the solicitation. The technical content section of the proposal is limited to 22 printed pages in length.

_____ 4. The **PROPOSED BUDGET** (Form 9.3) has been completed, including signature, and is the **last page** of the proposal. The proposal budget is for $95,000 or less. No more than one-third of the budget is allocated to consultants and/or subcontractors. See Section 3.6 for additional information.

_____ 5. Other Supplemental Budget Documentation is provided in accordance with Section 9.4.

_____ 6. SBIR Funding Agreement Certification (Form 9.5) completed and provided; offeror meets program requirements including eligibility requirements in Paragraph 1.5 for transition rates.

_____ 7. In accordance with Section 3.5, provide list of prior Phase II awards for proposers awarded more than 15 SBIR Phase II awards in the prior five fiscal years, if applicable.

_____ 8. Screen shot or similar copy of Company Registry is provided in accordance with Section 3.3.2.

_____ 9. The entire technical proposal, including forms and technical content, is **25 pages or less in length** (excluding Other Supplemental Budget Documentation, SBIR Funding Agreement Certification, SBIR.gov Company Registry documentation, and those pages necessary to comply with the itemization of prior SBIR Phase II awards) (see Section 3.2).

_____ 10. The proposal, cover page and project summary contains an easy-to-read font of at least 10 points (see Section 3.2).

_____ 11. The proposal contains only pages of 21.6cm x 27.9cm size (8 ½" x 11”) (see Section 3.2).

_____ 12. The proposal is limited to only one of the subtopics in Section 8 and 3.3.4(a).

_____ 13. The Principal Investigator/Project Manager will be employed by the company at least 51% of the time during the award period (see Section 1.5 and 1.7.9).

_____ 14. All work must be performed by the small business concern and its subcontractors in the United States, unless a waiver has been granted in advance by the CO (see Section 1.5). All supplies, materials, and equipment must be American Made unless a waiver has been granted by the CO.

NOTE: **Proposers are cautioned that late arrival of proposals shall result in them being rejected without evaluation.** Potential offerors are advised to sign up within https://www.fedbizopps.gov to receive notification of any amendment to the solicitation that may be released after opening date.